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MINERALOGICAL ABSTRACTS

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THE MINERALOGICAL MAGAZINE

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Place-names of mineral-localities in central Europe.

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[Read June 12, 1928.]

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THE place-names of mineral-localities in central Europe have presented many difficulties in connexion with the topographical indexes to 'Mineralogical Abstracts', and also in the much more extensive card-index of localities represented by specimens in the Mineral Collection

of the British Museum which has been in progress for many years. Further, I have been asked from several quarters to prepare a short check-list of equivalent names of those localities most frequently mentioned in mineralogical literature. When, in August 1927, Prof. F. Slavík was good enough to send me a copy of the manuscript list of Czechoslovakian localities and minerals which he had prepared in French for Prof. A. Lacroix for use in the Paris Museum, I at once recognized that with his co-operation a much more useful list could be prepared. This he readily assented to, and he has since extended his original list to include other countries. The main part of the work has, in fact, been done by him, but I do not wish to hold him responsible for some of the statements and arrangements.—L. J. S.

One of the many results of the European War of 1914–18 is the almost inextricable confusion that has arisen in the statement of many well-known mineral localities in central Europe. New States have been created, boundaries have been altered, and the official names of the places themselves have been changed. The places are still there, but now they may be in another country and be known by other names. For example, Nagyág, Transylvania, Hungary, the type locality for the mineral nagyagite, is now Săcărâmb in Romania. The mineral-name nagyagite will surely stand, and the place-name Nagyág can only slowly be forgotten through several generations of mineralogists. Again, the mineral vashegyite took its name from Vashegy (i.e. Iron Mountain or Eisenberg) in Hungary, which is now Železník in Czechoslovakia. Felsőbánya, Hungary, is now Baia-Sprie, Romania. Numerous other examples may be seen in the lists given below. In the case of the main geographical features and the larger cities, the change of country and of name can readily be traced from the ordinary atlases, gazetteers, and books of reference; e. g. Pressburg = Pozsony = Bratislava, and Klausenburg = Kolozsvár = Cluj. But for mineral-localities the case is far less easy. These are, as a rule, situated in thinly populated and mountainous regions, on areas of igneous and metamorphic rocks, infertile agriculturally, but in places metalliferous. The names of the mines and hamlets cannot always be found even on the maps of the local surveys.

The territory covered by the present lists corresponds (except for parts of Poland) with the former Austro-Hungarian monarchy. For this area there is available the standard work of Victor von Zepharovich, 'Mineralogisches Lexicon für das Kaiserthum Oesterreich', vol. 1 (1859),

vol. 2 (1873), vol. 3 (1893). The third volume, compiled by F. Becke after the death of the author, contains a useful index to localities, arranged under the several provinces and with indications of their positions. In addition to German names of places, those in other languages were also given in some cases, though not systematically and not always with the correct spelling. The present list has been more or less based on that of Zepharovich, giving the alternative place-names in the different languages and incorporating some new matter. Numerous memoirs and maps published during recent years are written in other languages now recognized officially, and the place-names in these languages are now coming into more general use. Place-names having the same pronunciation in the various languages, though slightly different in spelling, e. g. Lúčky = Lutschky = Lucski, and also those with equivalent terminations, e. g. -ice = -itz, -ovice = -owitz, &c., have in general not been included in the lists.

It must not be imagined, however, that these place-names are new merely because they are in languages not generally familiar. Many of them were in use before the migration of the Germans in the Middle Ages. The German names of the places have been familiar since the time of Georg Agricola ('De re metallica', 1556), and up to the present they have been almost universally adopted in mineralogical literature. But it is interesting to read, for example, in the account of Baron Born's travels in Hungary in 1770—'Sekeremb, the proper name of the place commonly known under the name of Nagyag'; and the name 'Zeleznik' appears in the works on Hungary by C. A. Zipser (1817) and F. S. Beudant (1822). On the other hand, some Hungarian names in Slovakia appear to be of more recent origin; e. g. Opálbánya for Dubnyik, Ötösbánya for Kotterbach, Sajóháza for Nadabula.

But another difficulty now arises. Owing to the mixture of races, there may be, for certain places, more than one name in the vernacular. Such alternative local names are at present recognized officially in Czechoslovakia when they represent the mother-tongue of at least 20 per cent. of the inhabitants of the place in question.

During the present period of transition, difficulties will continue to arise. The following lists are not offered as a solution of the problem, but merely as a check-list for purposes of reference. In the topographical indexes to 'Mineralogical Abstracts' no attempt has been made to establish a definite system. Place-names have there been indexed as they appear in the original publications. Many of the Czech names

have been given for localities in Bohemia and Moravia, but in the case of Slovakia, and also of Transylvania and Banat, most of the original work is still published in Hungary, and there the former Hungarian names are still adopted.

A series of very useful lists giving the variations in names for the better-known places has been prepared by the Permanent Committee on Geographical Names for British official use. These include :[1]

First general list of European names, 1921, 12 pp. [2nd edit., 1928.]
Second general list of European names, 1923, 8 pp.
First list of names in Czechoslovakia (Bohemia only), 1924, 16 pp.
Second list of names in Czechoslovakia (Moravia and Silesia), 1926, 12 pp.
First list of names in Romania (Transylvania only), 1926, 24 pp.
First list of names in the Kingdom of the Serbs, Croats and Slovenes (Yugoslavia), north-west, 1928, 20 pp.

Mr. J. H. Reynolds, by whom these scholarly works are compiled (and who has kindly helped us in several points of detail for the present paper), informs us that others in preparation include :

Third list of names in Czechoslovakia (Slovakia and Carpathian Ruthenia).
Second list of names in Romania (Banat, Crișana and Maramureș).
First list of names in Poland (west).

For information respecting localities in Bukovina, Transylvania, and northern Italy (formerly southern Tirol) Prof. Slavík was fortunately able to enlist the valuable services of Prof. D. I. Bujor, of the University of Cernauți, Prof. V. Stanciu, of the University of Cluj, and of Dr. Giovanni B. Trenner, of the Museum of Trento, respectively ; and and to these collaborators thanks are here expressed. The detailed list of localities in Poland, sent by Prof. Stefan Kreutz, of the University of Kraków, has been specially compiled for the present purpose by a committee of the Geological Survey of Poland, with the collaboration of S. Kreutz, S. Pawłowski, and K. Maślankiewicz, to whom thanks are also due. The list for Yugoslavia has been revised and considerably added to by Prof. Fran Tućan, of the National Museum at Zagreb. Dr. Károly Zimányi, of the Hungarian National Museum at Budapest, has given generous help with Hungarian place-names. Assistance has also been kindly given by the various legations in London and by the Czech Society of Great Britain.

[1] They are published, price sixpence each, for the Committee, by the Royal Geographical Society, Kensington Gore, London, S.W. 7.

Key to Pronunciation.[1]

Česky.	Croatian.	Polish.	Magyar.	Romanian.	German.	English.
—	—	ą	—	—	—	on (French)
c	c	c	c, cz	ţ	z	ts
č[2]	č	cz	cs	c (before e and i)	tsch	ch
ch	h	ch	—	h	ch	kh
ď	dj, gj	—	gy	—	dj	dy
dž	dž	dż (dź)	ds	g (before e and i)	dsch	j
ě	—	—	—	—	—	ye
—	—	ę	—	—	—	in (French)
j	j	j	j	i	j	y
ň	nj	ń	ny	—	nj	ny
ř	—	rz (pron. zh)	—	—	—	rzh
s	s	s	sz	s	ss	s (hard)
š	š	sz (ś)	s	ş	sch	sh
ť	ć	ć	ty	—	tj	ty
ů	—	ó	—	—	—	ū
z	z	z	z	z	(s soft)	z
ž	ž	ż (ź)	zs	j	sh	zh, j (French)
—	—	ł	—	—	—	ll (before a vowel nearly w)

Glossary of Geographical Terms.[3]

Akna (*Mag.*) = mine (a single shaft).
Alsó (*Mag.*) = lower.
Alt (*Ger.*) = old.
Arany (*Mag.*) = gold.

Bach (*Ger.*) = brook.
Bad (*Ger.*) = bath.
Baia (*Rom.*) = mine (mine workings).
Bánya (*Mag.*) = mine (mine workings).
Bei (*Ger.*) = near.
Berg (*Ger.*) = mountain.
Biały (*Pol.*) = white.
Brod (*Čes.*) = ford.

Černý (*Čes.*) = black.
Červený (*Čes., Slovak*) = red.
Český[4] (*Čes.*) = Czech, Bohemian.
Czarny (*Pol.*) = black.

de jos (*Rom.*) = lower.
de sus (*Rom.*) = upper.
Deutsch (*Ger.*) = German.
Dlhý (*Slovak*) = long.
Dolina (*Čes., Slovak, Croat., Pol.*) = valley.
Dolní (*Čes.*) = lower.
Dolny (*Pol.*) = lower.
Donji, donja (*Croat.*) = lower.

[1] Compare Lord Edward Gleichen and J. H. Reynolds, Alphabets of foreign languages transcribed into English according to the R.G.S. II system. Royal Geographical Society, Technical Series, no. 2, London, 1921.

[2] In the Česky alphabet č comes after c, ch [= kh] after h, š after s, and ž after z; this arrangement is not followed here, nor in the alphabetical index to the volume. Also in the other languages, Magyar, Polish, &c., the diacritical marks on letters are ignored in the present alphabetical arrangements.

[3] Compare A. Knox, Glossary of geographical and topographical terms and words of frequent occurrence in the composition of such terms and of place-names. Stanford's Compendium of Geography and Travel (supplementary volume), London, 1904.

[4] Český, Malý, &c. (masc.), česká (fem.), české (neuter and plural).

Dorf (*Ger.*) = village.
Důl (*Čes.*) = mine.

Eisen (*Ger.*) = iron.
Erdő (*Mag.*) = forest.

Falu, falva (*Mag.*) = village.
Fehér, fejér (*Mag.*) = white.
Fekete (*Mag.*) = black.
Feld (*Ger.*) = field.
Fels (*Ger.*) = rock.
Felső (*Mag.*) = upper.

Gebirge (*Ger.*) = mountain range.
Gora (*Croat.*, *Slovene*) = mountain.
Góra, góry (*Pol.*) = mountain, mountains.
Gornji, gornja (*Slovene*, *Croat.*) = upper.
Gross (*Ger.*) = great.
Grube (*Ger.*) = mine.

Ház (*Mag.*) = house.
Hegy (*Mag.*) = mountain.
Hegység (*Mag.*) = mountain range.
Hora (*Čes.*) = mountain.
Horní (*Čes.* = upper.
Hory (*Čes.*) = mines, mountains.

Jug (*Croat.*) = south.
Jung (*Ger.*) = young.

Kis (*Mag.*) = little.
Klein (*Ger.*) = little.
Kő (*Mag.*) = stone.
Kőzet (*Mag.*) = rock.

Lázně (*Čes.*) = baths.
Louka (*Čes.*) = meadow.

Magyar (*Mag.*) = Hungarian.
Mali (*Croat.*) = little.
Malý (*Čes.*) = little.
Mały (*Pol.*) = little.
Mare (*Rom.*) = great.
Mährisch (*Ger.*) = Moravian.
Město (*Čes.*) = town.
Mező (*Mag.*) = meadow.
Mic, mică (*Rom.*) = little.
Miedź (*Pol.*) = copper.
Mladý (*Čes.*) = young.
Moravský (*Čes.*) = Moravian.
Munte, munții (*Rom.*) = mountain, mountains.

Na (*Čes.*, *Croat*) = on.
na Moravě (*Čes.*) = in Moravia.
nad Labem (*Čes.*) = on the Elbe.
Nagy (*Mag.*) = great.
Negru, neagră (*Rom.*) = black.
Německý (*Čes.*) = German.
Német (*Mag.*) = German.
Neu (*Ger.*) = new.
Niemiecki (*Pol.*) = German.
Nižný (*Slovak*) = lower.
Nou (*Rom.*) = new.
Novi (*Croat.*) = new.
Nový (*Čes.*) = new.
Nowy (*Pol.*) = new.

Ó (*Mag.*) = old.
Ober (*Ger.*) = upper.
Ocna (*Rom.*) = mine (a single shaft).
Oláh (*Mag.*) = Romanian.

Patak (*Mag.*) = brook.
Planina (*Croat.*) = mountain.
Potok (*Čes.*, *Slovak*, *Pol.*, *Croat.*) = brook.

Réz (*Mag.*) = copper.

Salz (*Ger.*) = salt.
Só (*Mag.*) = salt.
Stadt (*Ger.*) = town.
Starý (*Čes.*) = old.
Stein (*Ger.*) = stone.
Svatý (*Čes.*) = saint.
Svet (*Slovene*) = saint.
Szent (*Mag.*) = saint.

Teplice (*Čes.*, *Slovak*) = hot springs.
Thal, Tal (*Ger.*) = valley.
Toplice (*Croat.*) = hot springs.
Tót (*Mag.*) = Slovak.

U (*Čes.*) = near.
Uherský (*Čes.*) = Hungarian.
Uj, új (*Mag.*) = new.
Unter (*Ger.*) = lower.
Úr (*Mag.*) = gentleman.

V, ve (*Čes.*) = in.
Vár (*Mag.*) = fortress.
Város (*Mag.*) = town.
Vas (*Mag.*) = iron.
Vechiu, veche (*Rom.*) = old.

Velik (*Croat.*) = great.
Velký (*Čes.*) = great.
Veres, vörös (*Mag.*) = red.
Ves (*Čes.*) = village.
Víz (*Mag.*) = water.
Voda (*Čes.*, *Slovak*, *Croat.*) = water.
Völgy (*Mag.*) = valley.
Vrh (*Croat.*, *Slovene*) = peak.

Wald (*Ger.*) = forest.
Wielki (*Pol.*) = great.
Wiese (*Ger.*) = meadow.
Windisch (*Ger.*) = Wendish = Slovene.

Železo (*Čes.*, *Slovak*) = iron.
Zlatý (*Čes.*, *Slovak*) = golden.
Złoty (*Pol.*) = golden.

Czechoslovakia[1] (Československo, Československá Republika) [*Pol.* Czechosłowacja, *Ger.* Tschechoslowakien, *Fr.* Tchécoslovaquie, *Mag.* Cseh-Szlovákia, *Rom.* Ceho-Slovacia.]

BOHEMIA (Čechy; *Ger.* Böhmen).

County (župa).	Capital (sídlo).
I.[2] Pražská	Praha (Prague, *Ger.* Prag).
II. Pardubická	Pardubice (*Ger.* Pardubitz).
III. Králové-Hradecká	Hradec Králové (*Ger.* Königgrätz).
IV. Mlado-Boleslavská	Mladá Boleslav (*Ger.* Jungbunzlau).
V. Českolipská	Česká Lípa (*Ger.* Böhmisch-Leipa).
VI. Lounská	Louny (*Ger.* Laun).
VII. Karlovarská	Karlovy Vary (Carlsbad; *Ger.* Karlsbad).
VIII. Plzeňská	Plzeň (*Ger.* Pilsen).
IX. Budějovická	Budějovice (*Ger.* Budweis).

Česky (*Czech*).	*German.*	*Minerals*
Bečov (VI)	Petschau ...	Kyanite, corundum.
Běloves (III) ...	Bielowes ...	Cuprite, olivenite.
Benešov nad Ploučnicí (V).	Bensen an der Polzen.	Zeolites (mesolite, &c.).
Beroun (I)	Beraun ...	Stibnite (*not* beraunite; *see* Svatá Dobrotivá).
Bílina (VI)	Bilin	Cimolite, anauxite.
Blatno (Horní Blatná) (VII)	Platten ...	Haematite, polianite, pyrolusite.
Boněnov (VIII) ...	Punau ...	Triplite, stibnite.
Bořislav (VI) ...	Boreslau ...	Augite.

[1] The spelling 'Czechoslovakia' usually adopted in English is in part the Polish form of the name. According to the key to pronunciation given above, it should be Cheskoslovakia.

[2] The Roman numerals, used to indicate the counties in which the following localities are situated, are those on the map (scale 1 : 1,000,000) of Czechoslovakia by Frant. Machát (Praha-Smíchov, 1921), and on the map (1 : 600,000) by G. Freytag & Berndt (Wien, 192?). These counties were created by the law of 1920 and they have been abolished again by the law of 1927.

Česky (*Czech*).	*German.*	*Minerals.*
Borkovice (I) ...	Borkowitz ..	Fichtelite.
Březnice nad Labem (V)	Schönpriesen ...	Zeolites.
Březno nad Labem (V)	Grosspriesen ...	Zeolites.
Brlohy (IX)	Berlau ...	Berlauite, enophite.
Broumov (III) ...	Braunau ...	Meteoric iron.
Budějovice (IX), *see* České Budějovice.		
Čáslav (I) ...	Czaslau ...	Prehnite, clinozoisite, zeolites.
Čeřeniště (V) ...	Tschersing ...	Zeolites (phacolite, &c.).
Čermíky (VII) ...	Tschermig ...	Tschermigite.
Černá (IX) ...	Schwarzbach ...	Graphite, ihleite.
Černošín (VIII) ...	Czernoschin (Tschernoschin)	Hornblende, augite.
Černovice (VIII) ...	Czernowitz (Czarlowitz)	Blende, galena.
Česká Lípa (V) ...	Böhmisch Leipa	Natrolite, apophyllite.
České Budějovice (IX)	Budweis ...	Andalusite, moldavite.
Český Brod (I) ...	Böhmisch Brod	Malachite, chessylite.
Český Krumlov (IX)	Böhmisch Krumau.	Graphite.
Cheb (VII)	Eger	Idocrase (egeran) (*see* Hazlov).
Choceň (II)	Chotzen ...	Terrestrial iron.
Chuchle (I)	Kuchelbad ...	Natrolite, analcime, datolite, aluminite.
Cínvald (VI) ...	Zinnwald ...	Cassiterite.
Děčín (V) ...	Tetschen ...	Baryte, zeolites.
Dědova Hora (I) ...	Giftberg ...	Cinnabar, baryte, ankerite, chalybite.
Dlažkovice (VI) ...	Dlaschkowitz ...	Pyrope sands.
Domažlice (VIII) ...	Taus	Arsenopyrite, pinguite.
Doubice (V)	Daubitz ...	Natrolite.
Doupov (VII) ...	Duppau ...	Augite, hornblende.
Duchcov (VI) ...	Dux	Duxite.
Dyleň (Mt.) (VII) ...	Tillenberg ...	Andalusite.
Františkovy Lázně (VII)	Franzensbad ...	Vivianite, marcasite, kieselguhr.
Hazlov (*near* Cheb) (VII)	Haslau (*near* Eger).	Idocrase, wollastonite, sahlite, opal, pericline.

Česky (*Czech*).	*German.*	*Minerals.*
Hazlov *or* Hazlava (*near* Ronšperk (VIII)	Haslau (*near* Ronsperg).	Hercynite, sapphire.
Herlíkovice (IV) ...	Hackelsdorf ...	Magnetite.
Hodějovice (IX) ...	Hodowitz ...	Silver, mimetite.
Hodkovice (IV) ...	Liebenau ...	Moonstone, agate.
Holubov (IX) ...	Hollubau ...	Magnesite.
Hořenec (VI) ...	Horschenz ...	Aragonite.
Horní Blatná (VII), *see* Blatno.		
Horní Kamenice (V)...	Ober-Kamnitz	Zeolites (lévyne, &c.).
Horní Roketnice (IV)	Ober-Rochlitz	Chalcosine, chalcopyrite allophane.
Hory Svaté Kateřiny (VI).	Katharinaberg	Chalcopyrite, fluorite.
Hradiště (Mt.) (VI) ...	Hradisch ...	(*see* Bílina).
Hroby (VI)	Klostergrab ...	Argentite, galena.
Jáchymov (VII) ...	Joachimstal, Joachimsthal.	Ores of U, Ag, Co, Ni, Bi, As.
Jakuby (V) ...	Jakuben ...	Zeolites.
Jedová Hora (I), *see* Dědova Hora.		
Jesničany (VII) ...	Gösen... ...	Celadonite.
Jičín (IV)	Jitschin (=Gitschin).	Pyrope, olivine.
Jilemnice (IV) ...	Starkenbach ...	'Star quartz', copper ores.
Jílové (I)	Eule	Gold.
,, (V)	Eulau... ...	Zeolites (scolecite, &c.).
Jizerská Louka (IV) ...	Iserwiese	Nigrine, ilmenite ('iserine'), sapphire, spinel.
Jizerské Hory (IV) ...	Isergebirge	
Kadaň (VII) ...	Kaaden ...	Thomsonite, celadonite.
Karlovy Vary (VII) ...	Karlsbad ...	Aragonite, pisolite, orthoclase twins.
Knín (I), *see* Nový Knín.		
Kolozruky (VI) ...	Kolosoruk ...	Jarosite, miemite, calcite.
Komárov (I)	Komarow *or* Komorau.	Oolitic haematite (*see also* Dědova Hora).
Komořany (VI) ...	Kommern ...	Gypsum.
Kopisty (VI)	Kopitz ...	Whewellite.
Kostomlaty (VI) ...	Kostenblatt ...	Sanidine, olivine.
Kozákov (Mt.) (IV) ...	Kozakow (Kosakow).	Jasper, agate, amethyst, heulandite.

Česky (*Czech*).	*German.*	*Minerals.*
Kraslice (VII) ...	Graslitz ...	Pyrite, pyrrhotine, chalcopyrite.
Krásná Hora (I) ...	Schönberg ...	Antimony, stibnite, gold.
Krásné Březno (V), *see* Březnice nad Labem.		
Křemže (IX) ...	Krems ...	Pyrope with kelyphite, opal.
Krkonoše (Mts.) (III–IV).	Riesengebirge	Pyrrhotine, scheelite, orthoclase.
Krumlov (IX), *see* Český Krumlov.		
Krupka (Horní Krupka) (VI).	Graupen (Ober-Graupen).	Cassiterite, fluorite, &c.
Krušná Hora (I) ...	Kruschnahora	Oolitic haematite, baryte.
Kšice (VIII)	Kscheutz ...	Blende.
Kutná Hora (I) ...	Kuttenberg ...	Blende, galena, pyrite, cronstedtite, serpentine.
Kynžvart (VII) ...	Königswart ...	Triplite, amblygonite.
Lhota u Pocínovic (VIII).	Mehlhut ...	Ilmenite, hortonolite.
Liberec (IV)	Reichenberg ...	Orthoclase, albite, epidote.
Libušín (VI)	Libuschin ...	Millerite, ankerite, calcite.
Litmice (VII) ...	Littmitz ...	Marcasite.
Litoměřice (V) ...	Leitmeritz ...	Zeolites (thomsonite, &c.).
Loket (VII)	Elbogen ...	Orthoclase, meteoric iron.
Lom u Duchcova (VI)	Bruch bei Dux	Whewellite.
Lukavičky (II) ...	Klein-Lukawitz	Pyrite, pyrophyllite.
Lužice (VI)	Luschitz ...	Opal.
Lysá (IV)	Lissa	Meteoric stone.
Malá Úpa (III) ...	Klein-Aupa ...	Arsenopyrite.
Malé Březno (V) ...	Klein-Priesen...	Zeolites.
Malešov (I)	Malleschau ...	Magnetite, andradite, hedenbergite, amphibole.
Marianská Hora (V)	Marienberg ...	(*see* Ústí nad Labem).
Marianské Lázně (VII)	Marienbad ...	Serpentine, nepheline, melilite.
Měrunice (VI) ...	Meronitz ...	Pyrope.
Michalovice (VIII) ...	Michelsberg ...	Stibnite.
Mikulov (VI)... ...	Niklasberg ...	Argentite, galena, arsenic.
Milešov (I)	Mileschau ...	Antimony, stibnite, gold.
Mladá Vožice (I) ...	Jung Woschitz	Serpentine, chalcedony, rutile.

Česky (*Czech*).	*German.*	*Minerals.*
Mokrá (IX)	Mugrau ...	Graphite, ihleite.
Most (VI)	Brüx	Whewellite.
Nelahozeves (VI) ...	Mühlhausen ...	Aluminite.
Německý Brod (I) ...	Deutsch-Brod...	Wollastonite, sillimanite.
Neštěmice (V) ...	Nestomitz ...	Zeolites, fluorite.
Nová Paka (IV) ...	Neupaka ...	Jasper, agate, &c.
Nový Knín (I) ...	Neuknin ...	Gold.
Nučice (VI)	Nutschitz ...	Chamosite, destinezite.
Nýřany (VIII) ...	Nürschan ...	Chalcedony in coal.
Obří důl (III) ...	Riesengrund ...	Pyrrhotine, scheelite.
Ohnišťovice (VIII) ...	Wonischen ...	Beryl.
Otov (VIII)	Wottawa ...	Beryl, clinozoisite.
Ouvaly *or* Úvaly (I) ...	Ouvaly *or* Auwal	Haematite, aphrosiderite.
Pancíř (Mt.) (VIII) ...	Panzer (Berg)	Kyanite, andalusite.
Pelhřimov (I) ...	Pilgram ...	Cordierite.
Písek (IX)	Pisek	Beryl, bertrandite, pisekite.
Plavo (IX)	Plaben ...	Pseudophite.
Ploškovice (V) ...	Ploschkowitz ...	Meteoric stone.
Plzeň (VIII) ...	Pilsen	Kaolin.
Pocínovice (VIII) ...	Putzeried ...	Ilmenite, hortonolite.
Podmokly (V) ...	Bodenbach ...	(*see* Jílové = Eulau).
Podsedice (VI) ...	Podsedlitz ...	Pyrope.
Praha (I)	Prag	Gypsum, calcite, destinezite.
Příbram (I)	Przibram ...	Silver-ores.
Přísečnice (VII) ...	Pressnitz ...	Magnetite, haematite, picrosmine.
Proboštov (V) ...	Proboscht ...	Sphene (castellite).
Radejšín (VI) ...	Radzein ...	Zeolites (zeophyllite, &c.).
Rakovník (VI) ...	Rakonitz ...	Strontianite, chalybite.
Řepčice (V)	Rübendörfel ...	Chabazite.
Říčany (I)	Rzitschan ...	Orthoclase.
Ronšperk (VIII) ...	Ronsperg ...	(*see* Hazlov).
Roztoky nad Labem (V)	Rongstock an der Elbe.	Blende (veins in essexite).
Sedlice (VII) ...	Zettlitz ...	Kaolin.
Slaný *or* Slané (VI) ...	Schlan ...	Whewellite.
Slavkov (VII) ...	Schlaggenwald	Cassiterite, wolframite, karpholite, topaz, &c.

Česky (*Czech*).	*German.*	*Minerals.*
Sněžka (Mt.) (III) ...	Schneekoppe ...	Wolframite.
Soběslav (I)	Sobieslau ...	Rutile.
Stará Vožice (I) ...	Alt Woschitz ...	Galena, blende, stephanite.
Staré Sedlo (VII) ...	Altsattel ...	Marcasite.
Středohoří (Mts.)(V–VI)	Mittelgebirge...	Zeolites, &c.
Stříbrné Horky (I) ...	Böhmisch-Schützendorf.	Anthophyllite.
Stříbro (VIII) ...	Mies	Baryte, cerussite, galena.
Střížovice (V) ...	Strisowitz ...	Thomsonite, natrolite.
Sušice (VIII) ...	Schüttenhofen	Lepidolite, rubellite, monazite, xenotime.
Svatá Dobrotivá (VIII)	Santa Benigna	Cacoxenite, beraunite.
Světec (VI)	Schwaz ...	Bilinite.
Teplá (VIII) ...	Tepl	Meteoric iron.
Třebenice (VI) ...	Trebnitz ...	Pyrope sands.
Třibivlice *or* Třebivlice (VI).	Triblitz ...	Pyrope sands.
Uhošť (VII)	Atschau ...	Celadonite.
Ústí nad Labem (V)	Aussig an der Elbe.	Natrolite, thomsonite, apophyllite, hibschite.
Valeč (VII)	Waltsch ...	Hyalite, staffelite, aragonite.
Váňov (V)	Wannow ...	Zeolites.
Velká Úpa (III) ...	Gross-Aupa ...	Arsenopyrite (*see also* Obří důl).
Veselí (V)	Wesseln (Toller Graben).	Analcime.
Vlastějovice (I) ...	Hammerstadt	Magnetite, andradite, fluorite.
Vlčák *or* Vlčí Hora (VIII).	Wolfsberg ...	Amphibole, augite.
Vrabčí (IX)	Prabsch ...	(*see* Křemže).
Vrchlabí (IV) ...	Hohenelbe ...	Magnetite.
Výprty (VII) ...	Weipert ...	Galena, argentite, fluorite.
Výškovice (VIII) ...	Wischkowitz ...	Serpentine, palygorskite.
Žacléř (III)	Schatzlar ...	Coal.
Zálezly (V)	Salesl (Salesel)	Zeolites.
Zbislav (I)	Zbislau ...	Almandine, apatite.
Žím (VI)	Schima ...	Opal, hornblende.
Zlatá Koruna (IX) ...	Goldenkron ...	Opal.

Moravia (Morava)[1] [*Ger.* Mähren].

County (župa).	Capital (sídlo).
X. Jihlavská	... Jihlava (*Ger.* Iglau).
XI. Brněnská	... Brno (*Ger.* Brünn).
XII. Olomoucká ...	... Olomouc (*Ger.* Olmütz).
XIII. Uhersko-Hradištská	... Uherské Hradiště (*Ger.* Ungarisch-Hradisch).
XIV. Moravsko-Ostravská	... Moravská Ostrava (*Ger.* Mährisch-Ostrau).

Česky (*Czech*).	*German.*	*Minerals.*
Aloisov (XII) ...	Alois-Thal ...	Enstatite, pseudophite.
Benkov (XII) ...	Pinke	Haematite, magnetite.
Beroun na Moravě (XII)	Bärn	Stilpnomelane.
Biskoupky (XI) ...	Biskupka ...	Meerschaum, magnesite.
Bludov (XII)	Blauda ...	Idocrase, wollastonite.
Brno (XI)	Brünn ...	Biotite.
Česká Ruda (XII) ...	Böhmisch-Eisenberg.	(*see* Aloisov).
Chabičov (XII) ...	Gobitschau ...	Thuringite ('moravite', 'mackensite', 'viridite').
Čichov (X)	Czichau ...	'Satin-spar', spodumene.
Heřmanov (X) ...	Hermannschlag	Anthophyllite.
Hodslavice (XIV) ...	Hotzendorf ...	Olivine, 'satin-spar'.
Hrubčice *or* Hrubšice (X).	Hrubschitz ...	Meerschaum, magnesite, chromite.
Hynčina (XII) ...	Heinzendorf ...	Stibnite, valentinite.
Jeseník (Mts.) (XII)...	Gesenke ...	(*see* Sobotín, Maršová).
Jihlava (X)	Iglau	Cordierite, pinite.
Koldštýn (XII) ...	Goldenstein ...	Graphite.
Kouty (XII)	Winkelsdorf ...	Epidote, beryl, zeolites.
Křtiny (XI)	Kiritein ...	Stalactites, phosphorite.
Květín (XII)... ...	Quittein ...	Evansite, allophane.
Libhošť (XIV) ...	Liebisch ...	Pectolite, apophyllite.
Maloměřice (XI) ...	Malomierschitz	Biotite.
Maršová (XII) ...	Marschendorf...	Chrysoberyl, epidote.
Modřice (XI)... ...	Mödritz ...	(*see* Žilošice).
Moravská Ostrava (XIV)	Mährisch-Ostrau	Coal, 'crystallized sandstone'.
Moravské Budějovice (X)	Mährisch-Budwitz ...	Prehnite, hyalite.
Němčice (XI)... ...	Niemtschitz ...	Cryst. stalactites of calcite.

[1] Klvaňa (J.). Nerosty Moravy a Slezska. Praha, 1882.

Česky (*Czech*).	*German.*	*Minerals.*
Nová Ves (*near* Oslavany) (XI).	Neudorf ...	(*see* Biskoupky).
Nová Ves (*near* Rýmařov) (XII).	Neudorf ...	Blende, caledonite.
Nový Jičín (XIV) ...	Neutitschein ...	(*see* Hodslavice).
Olomučany (XI) ...	Olomutschan . .	Cacholong, amethyst.
Ostružná (XII) ...	Spornhau ...	Staurolite.
Palačov (XIV) ...	Palzendorf ...	Natrolite, analcime.
Petrov (XII)	Petersdorf ...	Fuchsite.
Příbor (XIV)	Freiberg ...	Olivine pseudomorphs.
Řehořov (X)	Regens ...	Graphite, variscite.
Rejhanitce (XII) ...	Reigersdorf ...	Contact-minerals in limestone.
Řešice (X)	Röschitz ...	Hedenbergite, axinite.
Rožná (XI)	Rožna *or* Rožena	Rubellite, lepidolite, topaz.
Rudoltice (XII) ...	Rudelsdorf ...	Stilbite.
Rýmařov (XII) ...	Römerstadt ...	(*see* Nová Ves).
Slavkov na Moravě (XI)	Austerlitz ...	Gypsum.
Sobotín (XII) ...	Zöptau ...	Albite, epidote, talc, actinolite, sphene.
Stará Bělá (XIV) ...	Alt-Biela ...	Meteoric iron.
Staré Město (XII) ...	Altstadt ...	Graphite.
Štětinov (XII) ...	Stettenhof ...	Stilbite, chabazite.
Stonařov (X)... ...	Stannern ...	Meteoric stone.
Strážek (XI)	Straschkau ...	Scapolite, palygorskite.
Svinov (XII)	Schweine ...	Graphite.
Teplice u Sobotína (XII)	Wermsdorf *or* Wärmsdorf.	(*see* Sobotín).
Těšice (XII)	Tieschitz ...	Meteoric stone.
Tišnov (XI)	Tischnowitz ...	Amethyst, baryte.
Třebíč (X)	Trebitsch ...	Moldavite.
Tresné (XI)	Tressny *or* Gross-Tressny.	Graphite, secondary sulphates, evansite.
Veřovice (XIV) ...	Wernsdorf ...	Chalybite.
Veselí nad Moravou (XIII).	Wessely an der March.	Meteoric stone.
Vícenice (X)	Witzenitz ...	Chondrodite, hyalite.
Vídeň (X)	Wien	Triplite, tourmaline.
Vrbno (XII)	Würben ...	Enstatite.

Česky (Czech).	*German.*	*Minerals.*
Žďár (hora) (XII) ...	Zdiar *or* Zdjarberg.	Enstatite, 'pseudophite'.
Židenice (XI)... ...	Schimitz ...	Biotite.
Žilošice *or* Želešice (XI)	Schöllschitz ...	Diallage, serpentine, prehnite, zeolites (laumontite, &c.).
Znorovy (XIII) ...	Znorow ...	(*see* Veselí nad Moravou).

Czech Silesia (České Slezsko, *Ger.* Böhmisch-Schlesien) (formerly Austrian Silesia = Oesterreichisch Schlesien).

Česky (Czech).	*German.*	*Minerals.*
Benešov ve Slezsku ...	Bennisch ...	Iron-ores, baryte.
Kateřinky	Katharein ...	Gypsum.
Morávka Malá ...	Klein-Mohrau	Magnetite.
Opava	Troppau ...	Meteoric iron.
Těšín	Teschen ...	Analcime in teschenite.
Velká Kraš	Gross-Krosse ...	Monazite.
Vrbno...	Würbental ...	Magnetite, epidote, sphene, chlorite.

Slovakia (Slovensko).

Former Hungarian comitats (vármegye) now wholly or partly in Slovakia

Slovak.	*German.*	*Magyar.*
Abauj-Turňa ...	—	Abauj-Torna.
Bratislava	Pressburg ...	Pozsony.
Gemer	—	Gömör.
Hont	—	Hont.
Komárno	Komorn ...	Komárom.
Liptov	Liptau	Liptó.
Nitra	Neutra	Nyitra.
Novohrad	—	Nógrád.
Orava	—	Árva.
Ostrihom	Gran	Esztergom.
Šaryš	—	Sáros.
Spiš	Zips	Szepes.
Tekov	—	Bars.
Trenčín	—	Trencsén.
Turiec	—	Turócz.
Zemplín	—	Zemplén.
Zvolen	(Alt-)Sohl ...	Zólyom.

These are now divided among the following six counties :

County (župa).	Capital (sídlo).	Hungarian comitats (vármegye).
XV. Bratislavská	Bratislava ...	Pozsony, with parts of Komárom and Nyitra.
XVI. Nitranská	Nitra	Most of Nyitra and Bars, with parts of Komárom and Esztergom.
XVII. Považská ... ... (i. e. Váh [= Waag] river county)	Turčiansky Sväty Martin	Trencsén, Turócz, and Árva, with the Kremnica district of Bars.
XVIII. Pohronská ... ... (i. e. Hron [= Gran] river county)	Zvolen ...	Zólyom, part of Bars, Slovak portions of Hont and Nógrád, and western Gömör.
XIX. Podtatranská .. ... (i. e. sub-Tatra Mts.)	Liptovský Sväty Mikuláš	Liptó, larger part of Szepes, and eastern Gömör.
XX. Košická	Košice [= Kaschau = Kassa]	Sáros, a small part of Szepes, and the Slovak portions of Abauj-Torna and Zemplén.

Slovak.	*German.*	*Magyar.*	*Minerals.*
Baňská Bystrica (XVIII).	Neusohl ...	Beszterczebánya.	Copper-ores (*see* Španá Dolina).
Baňská tiavnica (XVIII), *see* Štiavnica.			
Belá (XVIII) ...	Dilln ...	Bélabánya ...	Diaspore, 'dillnite'.
Betliar (XIX) ...	— ...	Betlér ...	Baryte ('wolnyn').
Bratislava (XV)	Pressburg ...	Pozsony ...	Eukamptite.
Brhlovce (XVIII)	— ...	Borfő ...	Opal.
Červenica (XX)	Czerwenitza	Vörösvágás	Opal.
Chyžné (Chyžná Voda) (XIX).	— ...	Hisnyó *or* Hisnyóvíz.	Magnesite.
Čučma (XIX) ...	— ...	Csucsom ...	Stibnite, rhodonite.
Divín (XVIII)...	— ...	Divény ...	Magnesite.
Dlhá Lúka (XIX)	— ...	Hosszurét ...	Talc.
Dobšiná (XIX)...	Dobschau ...	Dobsina ...	Chalybite, tetrahedrite, nickel-ores.
Dubník (XX) ...	— ...	Dubnyik, *later* Opálbánya.	Opal.
Gecelovce (XIX)	— ...	Geczelfalva	Talc.
Gelnica (XX) ...	Göllnitz ...	Gölniczbánya	Chalcopyrite, chalybite, tetrahedrite, cinnabar.

Slovak.	*German.*	*Magyar.*	*Minerals.*
Hliník (XVIII)	— ...	Geletnek ...	Chalcedony in obsidian.
Hnilček (XIX)...	Klein-Hniletz	Kis Hnilecz	Chalybite, ankerite.
Hnilec (XIX) ...	Hniletz ...	Hnilecz ...	Chalybite.
Hnúšta (XVIII)	— ...	Nyustya ...	Magnesite.
Hodruša (XVIII)	Hodritsch ...	Hodrusbánya	Silver-ores, rhodochrosite, fassaite, secondary sulphates.
Hron (river) ...	Gran ...	Garam ...	(XVIII).
Hronec (XVIII)	Rhonitz *or* Ronitz.	Kis Garam...	Limonite.
Jelšava (XIX) ...	Eltsch ...	Jolsva ...	Magnesite.
Košice (XX) ...	Kaschau ...	Kassa ...	Magnesite.
Kotrbach (XIX)	Kotterbach...	Kotterpataka, *later* Ötösbánya.	Chalybite, chalcopyrite, cinnabar, schwazite.
Kremnica (XVII)	Kremnitz ...	Körmöczbánya.	Silver-ores, stibnite, secondary sulphates.
Kremnička (XVIII).	Kremnitzka	Ó-Körmöczke	Tridymite.
Kyšovce (XIX)	— ...	Kisocz, *later* Lándzsásőtfalu.	Manganese-ores.
Lenartov (XX)	Lenartow ...	Lénártó ...	Meteoritic iron.
Lubietová (XVIII)	Libethen ...	Libetbánya	Copper-ores, copper phosphates and arsenates.
Nadabulá (XIX)	Nadabula ...	Nadabula, *later* Sajóháza.	Chalybite, albite.
Nižná Slaná (XIX)	Unter-Szlana	Alsó-Sajó (Alsósajó)	Cinnabar, amalgam.
Nižné Slovinky (XX).	— ...	Szlovenka, *later* Alsó-Szallánk.	Chalybite, chalcopyrite, tetrahedrite.
Nová Baňa (XVIII).	Königsberg	Újbánya ...	Pharmacosiderite.
Ochtiná (XIX)...	— ...	Ochtina, *later* Mártonháza	Magnesite, talc, aragonite.

Slovak.	*German.*	*Magyar.*	*Minerals.*
Pezinek (XV) ...	Bösing ...	Bazin ...	Stibnite, pyrite.
Piesky (XVIII)	Sandberg ...	Homokhegy	(*see* Španá Dolina).
Pliešovce (XVIII)	— ...	Tótpelsőcz ...	Magnesite.
Prešov (XX) ...	— ...	Eperjes ...	Halite (*see also* Dubník).
Pukanec (XVIII)	Pukkanz (Bugganz).	Bakabánya ...	Hypersthene.
Ratkovská Suchá (XIX).	— ...	Ratkó-Szuha (Ratkószuha)	Magnesite.
Rožňava (XIX)	Rosenau ...	Rozsnyó ...	Chalybite, ankerite, chalcopyrite, baryte ('wolnyn'), bournonite, &c.
Sirk (XIX) ...	— ...	Szirk ...	(*see* Železník).
Smolník (XX) ...	Schmöllnitz	Szomolnok ...	Pyrite, chalcopyrite, secondary sulphates.
Solnohrad (XX)	Salzburg ...	Sóvár ...	Halite, gypsum, dolomite.
Španá Dolina (XVIII).	Herrengrund	Úrvölgy ...	Chalcopyrite, tetrahedrite, celestine, herrengrundite (úrvölgyite), malachite, aragonite.
Spišská Nová Ves (XIX).	Zipser Neudorf.	Igló ...	Chalybite, tetrahedrite, aragonite.
Staré Hory (XVIII).	Altgebirge ...	Óhegy ...	Gold, copper-ores.
Štiavnica (*or* Baňská Štiavnica (XVIII).	Schemnitz ...	Selmeczbánya	Blende, pyrargyrite, stephanite, quartz varieties, baryte.
Štítnik (XIX) ...	— ...	Csetnek ...	Chalybite.
Tajov (XVIII)...	Tajowa ...	Tajó ...	Realgar, orpiment.
Tri Vody (XVIII)	Dreiwasser...	Háromvíz ...	Opal.
Velká Divina (XVII).	Gross-Divina	Nagy Divina	Meteoric stone.
Velká Revúca (XIX).	Rauschenbach	Nagy Rőcze	Rutile.
Vondrišel (XIX)	Wagendrüssel	Merény ...	Chalcopyrite, chalybite.

Slovak.	*German.*	*Magyar.*	*Minerals.*
Vyhne (XVIII)	Eisenbach ...	Vihnye ...	(*see* Štiavnica).
Železník (Mt.) (XIX).	Zelesnik *or* Selesnik.	Vashegy ...	Chalybite, limonite, evansite, vashegyite.
Zlatá Ida (XX)	— ...	Aranyidka ...	Stibnite, jamesonite, berthierite
Žubkov (XVIII)	Schubkau ...	Zsupkó, *also* Erdő-Surány.	Tetradymite.

Carpathian Ruthenia (= Sub-Carpathian Russia; *Ruth.* Podkarpatskaja Rus, *Ger.* Karpathorussland).

Former Hungarian comitats now wholly or partly in Carpathian Ruthenia.

Ruthenian.	*Magyar.*
Bereh	Bereg.
Marmaroš	Máramaros.
Ugoča	Ugocsa.
Užhorod	Ung.

Ruthenian.	*Maygar.*	*Minerals.*
Berehovo ...	Beregszász ...	Alunite.
Bičkiv	Bocskó	Quartz ('Marmaros diamonds').
Kňahyňa ...	Knyahinya, *later* Csillagfalva.	Meteoric stone.
Koboleckaja Poljana.	Kobolapolyána, *later* Gyertyánliget.	Pyromorphite, cerussite, baryte.
Mužijevo ...	Muzsai	Alunite, baryte ('wolnyn').
Solotvina ...	Akna Szlatina ...	Halite, anhydrite.
Užhorod ...	Ungvár ...	Unghwarite (ungvarite).
Verecki ...	Vereczke ...	Quartz ('Marmaros diamonds').
Volovec ...	Ökörmező ...	Quartz ('Marmaros diamonds').

Austria (Oesterreich).

Carinthia (Kärnten; *Slovene*, Koroška).

German.	*Slovene.*	*Minerals.*
Eisenkappel ...	Železna Kapla ...	Cinnabar, galena, blende.
Klagenfurt ...	Celovec... ...	Copper-ores, cinnabar.
Saualpe ...	Svinska planina	Zoisite, carinthine, &c.

Styria (Steiermark; *Slovene*, Štajerska).

German.	*Slovene.*	*Minerals.*
Köflach...	Kovljano	Hartite, rutile.
Leoben...	Lubno ...	Diadochite, magnesite, talc, schrötterite.

Burgenland (formerly in Hungary).

German.	*Maygar.*	*Minerals.*
Bernstein	Borostyánkő	Chlorite (pseudophite), serpentine.
Schlaining	Szalónak	Stibnite, stibiconite, cervantite.

Hungary (Magyarország)

(*Ger.* Ungarn; *Rom.* Ungaria; *Česky*, Uhry, Maďarsko; *Croatian*, Madžarska).

A large part of Hungary, including the principal mining districts and mineral localities, has gone over into Romania and Czechoslovakia; other smaller parts have gone to Yugoslavia and Austria. In the remaining portion the majority of the place-names are in the one language only, and therefore they do not fall within the scope of the present list.[1]

Magyar.	*German.*	*Minerals.*
Balaton (lake) ...	Platten-See ...	Hornblende.
Börzsöny ...	Deutsch-Pilsen	Tetradymite.
Buda	Ofen	Calcite.
Pécs	Fünfkirchen ...	Chalybite.

Yugoslavia[2] (Kingdom of the Serbs, Croats and Slovenes) = Jugoslavija (Kraljevina Srba, Hrvata i Slovenaca).

Slovenia (Slovenija).

(*a*) Formerly part of Carinthia (Austria) = Koroška = Kärnten:—

Slovene.	*German.*	*Minerals.*
Črna	Schwarzenbach	Galena, greenockite.
Črno (Črna) ...	Cernagraben ...	Kaolin.
Dravograd ...	Drauburg ...	Tourmaline ('dravite'), margarodite.

[1] See V. von Zepharovich, loc. cit., and M. Tóth, Magyarország ásványai (The minerals of Hungary), Budapest, 1882.

[2] Most of the place-names in this list for part of Yugoslavia have been kindly supplied by Professor Fran Tućan, of the National Museum at Zagreb.

Slovene.	*German.*	*Minerals.*
Guštanj (*near* Meža).	Gutenstein ...	Tourmaline.
Jezersko ...	Seeland ...	Stibnite.
Kočna	Kotschna ...	Mercury.
Lješa (*near* Prevalje).	Liescha... ...	Chalcedony, kaolin.
Meža (Mežica) ...	Miss (Mies) ...	Sulphur, galena, blende, greenockite, chalcopyrite, anglesite, wulfenite.
Peca	Petzen	Galena.
Prevalje ...	Prävali	Graphite, galena, garnet.

(*b*) Formerly the larger part of Carniola (Austria) = Kranjska = Krain :—

Slovene.	*German.*	*Minerals.*
Bled	Veldes	Limonite.
Bohinj	Wochein ...	Bauxite (wocheinite), limonite.
Bohinjska Bistrica	Wocheiner Feistriz.	
Boštanj ...	Sauenstein ...	Haematite.
Češnjica (*near* Kropa).	Kerschdorf ...	Bauxite.
Češnjice ...	Kerschstätten ...	Galena.
Črnomelj ...	Tschernembl ...	Limonite.
Dolina Bistrice	Feistriz-Thal ...	Pyrite.
Gornje Sušice ...	Obersuschitz ...	Limonite.
Grosuplje ...	Grosslupp ...	Limonite.
Hrastnica ...	Hrastenza ...	Cinnabar.
Javornik ...	Jauerburg ...	Pyrolusite.
Ješce	Jesse	Galena.
Jesenice (*near* Bled).	Jesenou ...	Stibnite.
Kamniške Alpe	Steineralpen ...	Limonite.
Knapovše ...	Knapousche ...	Mercury, cinnabar, galena.
Kostanjevica ...	Landstrass ...	Limonite.
Kranj	Krainburg ...	Piauzite, pyrolusite.
Krašnja ...	Kraxen ...	Galena.
Kropa	Kropp	Pyrolusite.

Slovene.	*German.*	*Minerals.*
Krušica (*near* Jesenice).	Birnbaum ...	Bauxite.
Litija	Littai	Graphite, mercury, cinnabar, galena, blende, covellite, pyrite, marcasite, bornite, chalcopyrite, bournonite, tetrahedrite, haematite, cerussite, anglesite, baryte.
Ljubelj ...	Loibtal... ...	Galena, cinnabar.
Ljubljana ...	Laibach ...	Quartz, vivianite.
Metlika ...	Möttling ...	Limonite.
Mokronog ...	Nassenfuss ...	Galena, limonite, piauzite.
Novomesto ...	Rudolfswert ...	Limonite.
Pijavice ...	Piauze	Piauzite.
Poljane... ...	Pölland... ...	Galena, chalcosine, tetrahedrite.
Polšnik ...	Billichberg ...	Galena.
Ponoviče ...	Ponowitsch ...	Galena.
Potočnikov jarek	Pototschnig-Graben.	Cinnabar.
Radeče	Ratschach ...	Marcasite, tetrahedrite, malachite.
Ribnica ...	Reifnitz ...	Quartz.
Sava (*near* Radeče).	Saudörfel ...	Galena.
Savske Jame (*near* Jesenice).	Reichenberg ...	Realgar, galena, marcasite, chalcopyrite.
Selce	Selzach... ...	Chalcopyrite.
Šentjanž ...	Johannesthal ...	Marcasite.
Škofja Loka ...	Bischofslack ...	Mercury, cinnabar, chalcopyrite, pyrolusite, limonite.
Šmarje	St. Marein ...	Galena.
Stegovnik ...	Steguneks ...	Cinnabar.
Trebnje ...	Treffen	Limonite.
Tržič	Neumarktl ...	Cinnabar.
Turjak	Auersberg ...	Haematite.
Vače	Watsch (Waatsch)	Chalcopyrite.
Velike Lašče ...	Gross Laschitz...	Haematite.
Virloh	Werloch ...	Pyrolusite.
Višnja Gora ...	Weixelburg ...	Limonite.

Slovene.	*German.*	*Minerals.*
Zagorje-Trbovlje	Sagor-Trifail ...	Marcasite, chalcedony.
Zagradec ...	Sagratz ...	Limonite.
Železniki ...	Eisern	Pyrolusite.
Žirovski Vrh (*near* Trata).	Sairach-Berg ...	Bornite.
Zminec ...	Sminz	Chalcopyrite.
Žužemberk ...	Seisenberg ...	Limonite.

(*c*) Formerly part of Styria (Austria) = Štajerska = Steiermark :—

Slovene.	*German.*	*Minerals.*
Celje	Cilli	Copper-ores, pyrite, chalcopyrite, opal, nephrite.
Dramlje ...	Trennenberg ...	Opal.
Drava (river) ...	Drau	Gold.
Fužine (*near* Sv. Vida).	Edelsbach ...	Pyrite, marcasite.
Glože	Glosche ...	Graphite.
Gornja Bistrica	Ober-Feistritz ...	Serpentine.
Gornje Koče ...	Ober-Kötschl ...	Hornblende.
Gornja Polskava	Ober-Pulsgau ...	Hornblende.
Gornja Sv. Kungota na Pesnici.	Ober-Kunigund im Pössnitz-Thal.	Marcasite.
Hrastje ...	Hrastie... ...	Tourmaline.
Hrastnik ...	Hrastnigg ...	Galena, piauzite.
Hudi Kot (*near* Ribnica).	Bösenwinkel ...	Bornite, epidote.
Konjice ...	Gonobitz ...	Graphite, galena, chalybite, piauzite.
Kranjčica ...	Kraintschitza ...	Pyrite.
Laško	Tüffer	Sulphur, pyrite, quartz, halloysite, gypsum, piauzite.
Ledina (*near* Sevnica).	Ledein	Galena.
Lokavec ...	Lokautz ...	Galena.
Mura (river) ...	Mur	Gold.
Paka (*near* Konjice).	Paak	Blende, hemimorphite.
Pecelj	Petzel	Blende.

Slovene.	*German.*	*Minerals.*
Podčetrtek ...	Windisch-Landsberg.	Limonite, diopside.
Pohorje... ...	Bacher-Gebirge	Pyrrhotine, actinolite, diopside, hypersthene, saussurite, zoisite, talc, kaolin.
Pristovska Dolina.	Pristova-Thal ...	Bornite.
Rečica Potok ...	Retschitz Bach...	Pyrite.
Remšnik ...	Remschnigg ...	Galena, chalcopyrite, chalybite.
Ribnica na Pohorju.	Reifnigg ...	Bornite.
Rimske Toplice	Römerbad ...	Galena.
Rogaška Slatina	Rohitsch-Sauerbrunn.	Aragonite.
Rogatec ...	Rohitsch ...	Quartz.
Ruda (*near* Loka)	Ruth	Galena.
Ruše	Maria-Rast ...	Tetrahedrite, steatite.
Savski Brestovec	Reichenburg ...	Sulphur.
Šega	Schega	Quartz.
Skornov Vrh ...	Skorno-Berg ...	Hemimorphite.
Slovenja Bistrica na Pohorju.	Windisch Feistritz.	Hypersthene, zoisite, talc, kaolin.
Smrekovec (*near* Mozirje).	Smrekauc ...	Diopside.
Šoštanj... ...	Schönstein ...	Hemimorphite.
Sveti Martin v Rožni Dolini.	St. Martin in Rosenthal.	Galena.
Tinje	Tainach ...	Hornblende, zoisite.
Tinjska Gora ...	Tainachberg ...	Serpentine.
Trbovlje ...	Trifail	Andesine, piauzite.
Velika Pirešica	Gross-Pireschitz	Pyrite, marcasite.
Velunja ...	Velluna-Graben	Blende.
Vestrnica ...	Tresternitz ...	Bornite.
Vidina (*near* Rogatec).	Vedena... ...	Hypersthene.
Vitanje... ...	Weitenstein ...	Galena, chalybite.
Vurberk ...	Wurmberg ...	Gold.
Železno... ...	Schelesno ...	Pyrite, marcasite.
Zidani Most ...	Steinbrück ...	Galena, chalybite, cerussite.

CROATIA = Hrvatska = Kroatien (formerly with Hungary).

Serbo-Croatian.	*German.*	*Minerals.*
Varaždinske Toplice.	Warasdin Töplitz	Sulphur, aragonite.
Zagreb	Agram	Meteoric iron.

DALMATIA = Dalmacija = *Ital.* Dalmazia = *Ger.* Dalmatien (formerly with Austria).

Serbo-Croatian.	*Italian.*	*Minerals.*
Drniš	Dernis	Bauxite.
Krk (island) ...	Veglia	Bauxite.
Obrovac ...	Obrovazzo ...	Bauxite, phosphorite.

Italy (Italia).

VENEZIA TRIDENTINA

(= Alto Adige + Trentino; formerly southern Tirol [Tyrol] in Austria).

Italian.	*German.*	*Minerals.*
Adige (river) ...	Etsch	—
Alpe di Seis ...	Seisser-Alpe ...	Datolite, prehnite, zeolites.
Bolzano ...	Bozen	Fluorite, baryte.
Bressanone ...	Brixen	Garnet, tourmaline, eukamptite.
Casere	Kasern	Copper-ores.
Castel Pietra ...	Sprechenstein ...	Serpentine, antigorite.
Chiusa	Klausen ...	Galena, blende, chalcopyrite, fluorite, axinite, langite.
Colle d'Isarco ...	Gossensass ...	Galena.
Corvara ...	Rabenstein ...	Galena, fluorite.
Fleres	Pflersch ...	Galena, blende.
Fundoles (Fundres)	Pfunders ..	Almandine, sphene.
Isarco (river) ...	Eisack	*See* Vipiteno; Chiusa.
Lasa	Laas	Marble.
Malga di Borgo	Burgumer Alp ...	Garnet, idocrase.
Mezzaselva ...	Mittewald ...	Ilmenite, eukamptite.
Montenevoso ...	Schneeberg ...	Blende, pyrrhotine, xylonite, schneebergite.
Monzoni	Monzoni-Berg ...	*See* Val di Fassa.

Italian.	*German.*	*Minerals.*
Passo della Croce	Wildkreuzjoch ...	Magnetite, garnet, idocrase, chlorite, sphene.
Passo di Vizze ...	Pfitscherjoch ...	Anatase, brookite, chlorite.
Ponte di Ghiaccio	Eisbruck (Eisbrugg).	Sphene.
Predoi	Prettau ...	Calcite, adularia (*see also* Valle Aurina).
Racines	Ratschinges ...	Prehnite, spodumene, zoisite.
Ridanna ...	Ridnaun ...	*See* Vallicola di Ridanna.
Rio Rosso ...	Rotbachl ...	Magnetite, magnesite, kyanite (rhaetizite), chlorite, tourmaline, apatite.
San Giovanni ...	Sankt Johann ...	*See* Valle Aurina.
Sarentino ...	Sarnthein ...	*See* Val Sarentina.
Sciliar	Schlern... ...	Dolomite, celadonite.
Silandro ...	Schlanders ...	Marble, tremolite.
Siusi	Seiss	*See* Alpe di Seis.
Tisa d'Isarco ...	Theiss	Datolite, apophyllite, zeolites.
Trient	Trento	Quartz (compact varieties), baryte.
Tures	Taufers... ...	Wollastonite, sphene.
Val Gardena	Grödner-Thal ...	Ilmenite, dolomite.
Val Giudicaria	Judicarien-Thal	Gold, galena, andesine.
Val Pusteria ...	Puster-Thal ...	Albite, stilbite, sphene.
Val Sarentina ...	Sarn-Thal ...	Galena, fluorite.
Val Venosta ...	Vintschgau ...	*See* Silandro, Lasa, and Valle Lunga Carlino.
Val di Fassa	Fassa-Thal	Augite ('fassaite'), idocrase, gehlenite, brandisite, &c.
Val di Fiemme...	Fleims-Thal ...	Magnetite, fassaite, adularia, garnet.
Val di Non ...	Nonsberg ...	Gold, anthophyllite, olivine.
Val di Vizze ...	Pfitsch-Thal ...	Magnetite, adularia, albite, scapolite, garnet, chlorite, tourmaline, sphene, &c.
Val d' Ultimo ...	Ulten-Thal ...	Serpentine, bronzite.
Valle Aurina ...	Ahrn-Thal ...	Adularia, talc, sphene.
Valle Lunga Carlino.	Langtauferer-Thal	Andalusite, kyanite, fibrolite, staurolite.
Valle Passiria ..	Passeyer-Thal ...	Beryl (*see also* Montenevoso).

Italian.	*German.*	*Minerals.*
Vallicola di Ridanna.	Valtigels (Valligel).	Zoisite, tourmaline, apatite.
Vipiteno ...	Sterzing ...	Spinel, serpentine.

Venezia Giulia

(formerly part of Carniola = Krain, Austria).

Italian.	*German*	*Slovene.*	*Minerals.*
Idria ...	Idria ...	Idrija ...	Mercury-ores, idrialite, idrizite.
Rabelio ...	Raibl ...	Rabelj ...	Blende, galena, dolomite, &c.

Romania (România)

[*Ger.* Rumänien; *Fr.* Roumanie; *Mag.* Oláhország, Románia; *Čes.* Rumunsko; *Ital.* Romania.]

Crişana and Maramureş (Crişana şi Maramureş).

Romanian districts (judeţ, formerly comitats (vármegye) in north-eastern Hungary—

Romanian.	*Magyar.*
Arad	Arad (eastern portion).
Bihor	Bihar (south-eastern portion).
Maramureş	Máramaros (southern portion).
Sălagiu	Szilágy.
Satul-Mare	Szatmár (eastern portion).

Romanian.	*Magyar.*	*Minerals.*
Baia Mare ...	Nagybánya ...	Silver, gold, realgar, galena, bournonite, pyrargyrite, stephanite.
Baia Neagră ...	Feketebánya ...	Pyrite, pyrargyrite, baryte.
Baia Sprie ...	Felsőbánya ...	Stibnite, realgar, miargyrite, semseyite, fizelyite, diaphorite, baryte, felsőbányite, &c.
Băiţa (jud. Bihor)	Rézbánya ...	Copper-ores, bismuthinite, cosalite, dioptase, linarite, szajbelyite, hemimorphite, &c.
Bihor Mts. ...	Bihar	Bauxite.
Borşa	Borsabánya ...	Cerussite, anglesite.
Capnic (Cavnic)	Kapnikbánya (Kapnik).	Blende, realgar, bournonite, tetrahedrite, rhodochrosite, helvine, &c.

Romanian.	*Magyar.*	*Minerals.*
Chiuzbaia ...	Kisbánya ...	Blende, pyrrhotine, chalybitea semseyite, fizelyite.
Damiș	Dámos	Bauxite.
Feriza de jos ...	Alsó-Fernezely	Tetrahedrite.
Ilba	Illoba	Gold, copper, chalcopyrite, tetrahedrite, brochantite.
Nistru	Misztbánya ...	Chalcopyrite, tetrahedrite.
Pădurea craiului	Királyerdő ...	Bauxite.
Petroasa ...	Petrósz	Bauxite.
Remeți	Remecz	Bauxite.
Rimet	Remecz	Bauxite.
Scărița	Szkerisóra, Szkericza	Bauxite, diaspore.
Soncoius ...	Vársonkolyos ...	Bauxite.
Vișăul de sus ...	Felső-Visó ...	Anglesite.

Transylvania (Ardeal, Transilvania)

[*Mag.* Erdély ; *Ger.* Siebenbürgen].

Romanian districts (județ) formerly comitats (vármegye) in Hungary—

Romanian.	*Magyar.*	*German.*
Alba (Alba de jos) ...	Alsó-Fehér (Alsó-Fejér) ...	Unter-Weissenburg.
Brașov	Brassó	Kronstadt.
Ciuc	Csík	—
Cluj (Cojocna)	Kolozs	Klausenburg.
Făgăraș	Fogaras	—
Hunedoara	Hunyad	—
Mureș (Mureș-Turda) ...	Maros-Torda	—
Năsăud (Bistrița-Năsăud)	Besztercz-Naszód	Bistritz-Naszód.
Odorhei	Udvarhely	—
Sibiu	Szeben	Hermannstadt.
Someș (Solnoc-Dobâca)	Szolnok-Doboka	—
Târnava-Mare	Nagy-Küküllő	Gross-Kokel.
Târnava-Mică	Kis-Küküllő	Klein-Kokel.
Trei-Scaune	Háromszék	—
Turda (Turda-Arieș) ...	Torda-Aranyos	—

Romanian.	*Magyar.*	*Minerals.*
Abrud	Abrudbánya ...	Gold, chalcosine.
Almaș-Mare ...	Nagy-Almás ...	Gypsum, hornblende.
Almaș-Mic ...	Kis-Almás ...	Pyrite, chalcopyrite, cerussite.
Avrig	Felek (*Ger.* Freck)	Vivianite.

Romanian.	*Magyar.*	*Minerals.*
Baia de Arieș ...	Offenbánya, *later* Aranyosbánya (*Ger.* Offenburg)	Gold, tellurium, sylvanite, alabandine, cerussite
Baia Lăpușului	Oláh-Láposbánya	Gold, blende, stibnite, pyrrhotine, garnet, gypsum.
Băița (jud. Hunedoara).	Boicza	Gold, mispickel, pyrargyrite.
Băița (jud. Mureș)	Kisbánya ...	Cu-Ag-ores, gold, blende, galena, stibnite, dyscrasite, chessylite, garnet, epidote.
Bucium ...	Bucsum	Gold, blende, chalcopyrite, tetrahedrite.
Buru	Borév	Pyrrhotine, vivianite.
Căinel de sus ...	Felső-Kajanel ...	Gold, blende, tetrahedrite, baryte.
Călan	Magyar-Kályán	Gypsum, mirabilite.
Călimani-Izvor (Mt.).	Kelemen Izvór-hegy.	Sulphur.
Câmpeni ...	Topánfalva ...	Gold, mercury, tetrahedrite-malachite.
Căraci	Karács	Alabandine.
Cașolț	Magyar-Hermány	Diatomite.
Cluj	Kolozsvár, *Ger.* Klausenburg	Hyalite, gypsum.
Copșa-Mare ...	Nagy-Kapus ...	Celestine, gypsum.
Copșa-Mică ...	Kis-Kapus ...	Amethyst, agate, aragonite baryte.
Corond (*also* Corund).	Korond ...	Onyx-marble.
Covasna ...	Kovászna ...	Realgar, orpiment.
Crâscior ...	Kriscsor ...	Gold, stibnite, chalcopyrite, tetrahedrite.
Criș (river) ...	Kőrös	Gold (alluvial).
Cucului, *see* Muntele Cucului.		
Ditrău	Ditró	Sodalite, cancrinite, sphene.
Fața Baii (Mt.)	Faczebaja ...	Gold, tellurium.
Fizeș	Füzesd	Gold, pyrargyrite, baryte.
Ghelar	Gyalár	Limonite, chalybite.
Gilău	Gyalu	Aragonite.

Romanian.	*Magyar.*	*Minerals.*
Gura-Râului ...	Guraró ...	Albite, actinolite, garnet, kyanite, muscovite.
Jebuc	Zsobok... ...	Gypsum.
Mădăraș ...	Mező-Madaras ...	Meteoric stone.
Mănăsturul-Unguresc.	Magyar-Gyerő-Monostor.	Muscovite, tourmaline.
Mociu	Mocs	Meteoric stone.
Muncelul-Mic ...	Kis-Muncsel ...	Gold, cerussite.
Muntele Cucului [i.e. Cuckoo Mt.]	Kakuk-hegy ...	Haematite.
Ocna-Dejului ...	Deés-Akna, Désakna.	Salt deposits.
Ocna-Sibiului ...	Vizakna (*Ger.* Salzburg).	Salt deposits, anhydrite, polyhalite.
Ojdula	Osdola, Ozsdola	Ozokerite.
Pianul Român ...	Oláhpián ...	Gold, lead, platinum, iron, sapphire, ilmenite, garnet, partschine.
Poiana Aidului...	Nyirmező ...	Garnet, vivianite.
Praid	Parajd	Halite.
Puturosul (Mt.)	Büdös-hegy ...	Sulphur, alunite.
Racoșul de jos ...	Alsó-Rákos ...	Pyrolusite, chalybite.
Rășinari ...	Resinár (*Ger.* Städterdorf).	Omphacite, muscovite.
Răzoare (Mașca)	Macskamező ...	Goethite, manganite, pyrolusite.
Rodna-Veche ...	Ó-Radna ...	Blende, bournonite, cerussite, vivianite, &c.
Roșia-Montană...	Verespatak ...	Gold (electrum), β-quartz.
Rupea	Reps	Bronzite, serpentine.
Săcărâmb (Secărâmb).	Nagyág (Nagy-Ág, Szekerembe).	Gold, sulphur, realgar, hessite, sylvanite, krennerite, nagyagite, alabandine, rhodochrosite, hörnesite, &c.
Săliște	Szelistye ...	Silver, blende.
Sândominic ...	Csik-Szent-Domokos.	Copper, tridymite, malachite.
Satul	Czód (*Ger.* Zoodt)	Kyanite, tourmaline.
Sebeș (*or* Sebeșul)	Sebes	Kyanite, staurolite, tremolite.

Romanian.	*Magyar.*	*Minerals.*
Sibiu	Nagy-Szeben (*Ger.* Hermannstadt).	Marcasite, vivianite.
Solsciua ...	Szolcsva ...	Staurolite.
Someşul-Rece (valley).	Hideg Szamos ...	Graphite, gold, tourmaline.
Stănija	Sztanizsa ...	Gold, fluorite.
Surduc	Szurdok ...	Talc, epidote.
Tecărău (Tehărău)	Tekerő	Gold, tellurium, malachite, chessylite.
Trăscău ...	Toroczkó ...	Goethite, chalybite.
Trestia	Tresztia ...	Stibnite, chalcedony.
Uioara de sus ...	Maros-Újvár ...	Salt deposits, gypsum.
Uroiul (Dealul Uroiu)	Arany (*Ger.* Aranyer Berg).	Pseudobrookite, tridymite, hypersthene.
Vaţa de sus ...	Felső-Vácza ...	Smaltite, epidote, heulandite, stilbite.
Vinţul de jos ...	Alvincz ...	Smaltite.
Zlatna	Zalatna (*Ger.* Gross-Schlatten).	Gold, tellurium.

Bukovina (Bucovina)

[*Ger.* Bukowina; formerly in Austria].

Romanian.	*German.*	*Minerals.*
Arşiţa	Arschitza ...	Manganese-ores.
Cârlibaba ...	Kirlibaba ...	Galena, cerussite, chessylite, anglesite.
Cernauţi ...	Czernowitz ...	Marcasite, gypsum.
Fundul-Moldovei	Fundul-Moldowi	Chalcopyrite.
Jacobeni ...	Jakobeny ...	Manganese-ores.
Valea-Putnei ...	Waleputna ...	Manganese-ores.
Vatra Dornei ...	Dorna-Watra ...	Manganese-ores.

Banat (*Mag.* Bánát, Bánság; *Rom.* Banat).

The Romanian (eastern) part of the Banat comprises the judeţe Caraş and Severin (formerly comitat = vármegye Krassó-Szörény), and the judeţ Timiş-Torontal (parts of the comitats Temes and Torontál).

Romanian.	*Magyar.*	*Minerals.*
Bozovici ...	Bozovics (Bozovich).	Pyrite, chromite.

Romanian.	*Magyar.*	*Minerals.*
Ciclova ...	Csiklova ...	Bismuthinite, tetradymite, wollastonite, idocrase, apophyllite.
Dognecea ...	Dognácska ...	Bismuthinite, dognacskaite, pyrite, haematite, aragonite, garnet.
Gladna Română	Román Gladna...	Fischerite (uhligite).
Idioara ...	Zsidóvár ...	Iron-ores, kaolin.
Liubcova de jos	Ljupkova Donja (*Croat.*).	Iron-ores, chalcopyrite, garnet.
Moldova nouă ...	Új-Moldova ...	Copper, orpiment, chalcopyrite fluorite, cuprite, &c.
Ocna de fier (Moraviţa)	Moravicza (*Croat.* Moravica,), *later* Vaskő.	Bismuthinite, tetradymite, cobaltite, mispickel, bornite, garnet, idocrase.
Oraviţa ...	Oravicza ...	Bismuthinite, tetradymite, cobaltite, glaucodot, mispickel, bornite, garnet, idocrase.
Rusca montană...	Ruszkabánya (*Ger.* Ruskberg)	Stibnite, allophane.
Sasca montană...	Szászka ...	Chalcosine, covellite, apophyllite.
Tisoviţa ...	Tiszovicza (*Croat.* Tisovica).	Chromite, magnesite, hydromagnesite.

Poland (Polska ; *Ger.* Polen).[1]

I. Palatinate (województwo) of Śląsk = Silesia, *Ger.* Schlesien (formerly part of Prussian and Austrian Silesia).

Polish.	*German.*	*Minerals.*
Biały Szarlej[2]	Bley Scharley ...	Blende, galena, greenockite, marcasite (nickeliferous), jordanite, smithsonite, cerussite.
Bobrowniki ...	Bobrownik ...	Limonite.
Boguszowice ...	Boguschowitz ...	Analcime.
Brzeziny	Birkenhaim ...	Smithsonite, hemimorphite.

[1] This list of the more important mineral localities in Poland has been prepared by a Committee of the Geological Survey of Poland in collaboration with S. Kreutz, S. Pawłowski, and K. Maślankiewicz. Localities for coal, lignite, petroleum, the commoner iron-ores, and rock-phosphates are not included.

[2] The most important localities are indicated in heavy type.

Polish.	*German.*	*Minerals.*
Brzozowice ...	Brzosowitz ...	Blende, galena, marcasite, plumbocalcite, tarnowitzite, cerussite, smithsonite, hemimorphite.
Bytków (*near* Katowice).	Bittkow ...	Baryte.
Cecylja... ...	— ...	Blende, galena, marcasite, plumbocalcite, tarnowitzite, cerussite.
Chechło ...	Chechlau ...	Limonite.
Kokoszyce ...	Kokoschütz ...	Sulphur, calcite, baryte, celestine, gypsum.
Królewska Huta [i.e. Royal smelt-mill].	Königshütte	Pyrite, baryte.
Maciejkowice ...	Maczeikowitz ...	Dolomite.
Nakło	Nakel	Limonite.
Nowa Helena ...	— ...	Blende, galena, marcasite.
Pszów (*near* Rybnik).	Pschow ...	Sulphur, calcite, strontianite, baryte, celestine.
Radzionków ...	Radzionkau ...	Galena, smithsonite, cerussite, iglesiasite.
Repty	Repten	Limonite, hemimorphite.
Rozalja (*near* Wielka Dąbrówka).	... ...	Galena, cerussite.
Skoczów ...	Skotschau ...	Strontianite.
Szarlej	Scharley ...	Hemimorphite.
Tarnowskie Góry.	Tarnowitz ...	Blende, galena, marcasite, calcite, plumbocalcite, dolomite, smithsonite, aragonite, tarnowitzite, witherite, cerussite, phosgenite, baryte, anglesite, vivianite.
Wielka Dąbrówka	Gross-Dombrowka	Smithsonite, hemimorphite.
Woszczyce ...	— ...	Halite.

II. Palatinate of Kraków = Cracow, *Ger.* Krakau (formerly part of Galicia (Galizien), Austria).

Balin	Limonite.
Bochnia	Halite, anhydrite, gypsum.
Czerna (*near* Krzeszowice) ...	Marcasite, limonite, calcite.
Czorsztyn	Calcite.

Czyżówka	Limonite, hemimorphite.
Długoszyn	Smithsonite, hemimorphite.
Galman (*near* Trzebinia) ...	Galena, smithsonite, hemimorphite.
Giebułtów	Calcite.
Góry Luszowskie	Hemimorphite.
Jaworzno	Blende, Galena, limonite, smithsonite, cerussite, hemimorphite.
Jeleń	Limonite.
Kąty (Matylda mine)	Blende, galena, marcasite, limonite, calcite, smithsonite.
Kobierzyn	Gypsum.
Krzemionki (*near* Kraków) ...	Calcite.
Lgota	Hemimorphite.
Libiąż	Limonite.
Męcina Mała	Ozocerite.
Miękinia (*near* Krzeszowice) ...	Calcite, pilolite.
Mszana Dolna	Quartz.
Niedzieliska	Calcite, melanterite.
Nowa Góra (*near* Trzebinia) ...	Galena, limonite.
Nowa Wieś	Gypsum.
Nowy Sącz (*Ger.* Neu-Sandetz) ...	Calcite.
Ostrężnica (*near* Trzebinia) ...	Galena, cerussite.
Paczołtowice (*near* Krzeszowice)	Calcite.
Płoki	Limonite.
Podgórze (*near* Kraków) ...	Gypsum.
Podgórze-Bonarka (*near* Kraków)	Hatchettine.
Poręba	Amethyst, heulandite.
Psary	Limonite, hemimorphite.
Rybna	Gypsum.
Sambor	Quartz ('Marmaros diamonds').
Siemiota	Amethyst.
Siersza	Calcite.
Skotniki	Gypsum.
Sułkowa Wola	Gypsum.
Swoszowice	Sulphur, calcite, baryte, gypsum.
Szczepanowice (*near* Tarnów) ...	Marcasite.
Szczygłowice	Gypsum.
Tatry (Tatra Mts.)	Pyrite, chalcopyrite, tetrahedrite, quartz, haematite, manganese oxides, calcite, ankerite, chalybite,

	malachite, chessylite, garnet, tourmaline, chabazite, stilbite, prehnite, baryte.
Trzebionka	Blende, galena, cerussite, hemimorphite.
Wieliczka	Halite, anhydrite, gypsum.
Witkowice	Calcite.
Wodna	Galena, hemimorphite.
Wołowice	Gypsum.
Zabierzów	Calcite.
Żegocina (*Ger.* Rzegocina) ...	Gypsum.

III. Palatinate of Lwów = *Ger.* Lemberg (formerly part of Galicia (Galizien), Austria).

Borysław	Aragonite, gypsum, ozocerite.
Drohobycz	Halite.
Janów (*near* Lwów)	Succinite.
Lacko	Halite.
Lipki (*near* Truskawiec) ...	Sulphur, blende, galena.
Łupków	Calcite.
Mizuń	Schraufite.
Pomiarki (*near* Truskawiec) ...	Sulphur, aragonite, celestine.
Stebnik	Halite, sylvine, anhydrite, gypsum, langbeinite, picromerite, kieserite, polyhalite, leonite.
Truskawiec	Calcite, aragonite, celestine, mirabilite.
Tustanowice	Ozocerite.
Wolanka	Ozocerite.

IV. Palatinate of Stanisławów = *Ger.* Stanislau (formerly part of Galicia (Galizien), Austria).

Bolechów	Halite.
Bukaczowice (Kołokolin) ...	Gypsum.
Czywczyn (Mt.)	Galena.
Dolina	Halite.
Dźwiniacz	Sulphur, calcite, ozocerite.
Głuszków	Gypsum.
Horodenka	Gypsum.

Jezupol	Gypsum.
Kałusz	Halite, sylvine, carnallite, anhydrite, gypsum, epsomite, kaluszite, kainite, kieserite, leonite, polyhalite, picromerite.
Korczyn (*near* Skole)	Melanterite, keramohalite.
Kosów	Halite.
Łanczyn	Halite.
Morszyn	Kaluszite, polyhalite, mirabilite.
Polanica (*near* Bolechów) ...	Ozocerite.
Skole	Quartz ('Marmaros diamonds').
Starunia	Marcasite, ozocerite.
Stuposiany	Ozocerite.
Turza Wielka (*near* Kałusz) ...	Halite, sylvine, anhydrite, gypsum, polyhalite.
Wojniłów	Gypsum.

V. Palatinate of Tarnopol (formerly part of Galicia (Galizien), Austria).

Bilcze Złote; Buczacz; **Łokutki** (*near* Tłumacz); **Krzywcze** ...	Gypsum.

VI. Palatinate of Kielce, *Russ.* Кѣльцы (formerly in Russian Poland).

Bardo	Bardolite.
Bobrowniki	Hemimorphite.
Bolesław (*near* Olkusz) ...	Blende, galena, manganese oxides, calcite, smithsonite, hemimorphite.
Bukowno	Hemimorphite.
Chęciny	Calcite.
Chruszczobród	Hemimorphite.
Czarkowy	Sulphur, gypsum.
Czarnowskie Górki	Galena.
Dąbrowa Górnicza (Flora and Paryż mines)	Calcite.
Daleszyce (Góra Krzemionka) ...	Haematite.
Gałęzice	Baryte.
Góry Pieprzowe	Keramohalite.
Grodziec (*near* Będzin)	Quartz.
Hotelek	Gypsum.

Jaworznia	Galena, cerussite, baryte.
Jeraska	Smithsonite.
Kadzielnia	Pyrite, calcite, baryte.
Kajetanów (Góra Wiśniówka) ...	Wavellite.
Karczówka	Galena.
Klucze (*near* Olkusz)	Pyrite, limonite.
Krzyżanowice	Gypsum.
Lubienia	Psilomelane.
Machnowska Góra	Galena, chalcosine.
Mąchocice	Wavellite.
Miedziana Góra (*near* Chęciny)	Copper, chalcosine, covelline, chalcopyrite, blende, pyrite, tetrahedrite, quartz, cuprite, melaconite, limonite, calcite, smithsonite, malachite, chessylite.
Miedzianka (*near* Chęciny) ...	Galena, chalcosine, chalcopyrite, tetrahedrite, miedziankite, lubeckite, calcite, cerussite, malachite, chessylite, chrysocolla, anglesite, adamine, staszicite, baryte.
Mrzygłów	Cerussite.
Nierutowice	Hemimorphite.
Olkusz	Galena, marcasite (0·64 % Tl), smithsonite, cerussite, hemimorphite.
Płóczki (*near* Łagów)	Galena.
Posądza	Sulphur, celestine, gypsum.
Rudki (*near* Nowa Słupia) ...	Haematite.
Siewierz	Galena, cerussite.
Skiby (*near* Chęciny)	Galena.
Skorocice	Gypsum.
Sławków	Blende, galena, hemimorphite.
Starachowice	Strontianite, iron-ores.
Staszów	Gypsum.
Strawczynek	Baryte.
Strzemieszyce	Smithsonite, hemimorphite.
Szczerbaków	Gypsum.
Trzebiesławice	Hemimorphite.
Ulisses (*near* Olkusz)	Blende.
Wietrznia (*near* Kielce)	Calcite.
Wiślica	Gypsum.

Wiśniowa	...	...	Gypsum.
Wojkowice	...	...	Galena, hemimorphite.
Wyszmontów	...	...	Pyrite.
Zagnańsk	...	...	Quartz, haematite.
Zychcice ...	...	...	Hemimorphite.

VII. Palatinate of Poznań = *Ger.* Posen (formerly in Prussia).

Polish.	*German.*	*Minerals.*
Grzempy (*near* Czarnków).	Friedrichsau ...	Meteorite (Sept. 3, 1910).
Inowrocław ...	Hohensalza ...	Pyrite, halite, carnallite, gypsum.
Morasko ...	Morask ...	Meteoric iron (found 1914).
Solno ...	— ...	Halite.
Staniawy ...	Salzdorf ...	Halite.
Szaradowa ...	Szaradowo ...	Halite.
Szubin ...	Schubin ...	Potassium salts.
Wapno ...	Hansdorf ...	Halite, sylvine, carnallite, anhydrite, gypsum, kieserite, polyhalite.

VIII. Palatinate of Warszawa, *Russ.* Варшава, *Eng.* Warsaw, *Ger.* Warschau, *Fr.* Varsovie (formerly in Russian Poland).

Borki Grabowe; Brwilno; Chełchwy ...	Succinite.
Dobrzyń	Gypsum, melanterite, halotrichite, succinite.
Grabówka; Gutowa; Lipniki; Mamine Wyszki; Pierżanki; Przyłogi; Sredniczki; Wyszla; Zabiel; Żebra Zwierzchlas; Żebra Żabine.	Succinite.
Pułtusk	Meteoric stones.

IX. Palatinate of Pomorze = *Ger.* Pomerellen (formerly West Prussia = West Preussen).

Polish.	*German.*	*Minerals.*
Gdynia	— ...	Succinite.
Karolewr ...	Karolingen ...	Alum.
Swiecie ...	Schwetz ...	Meteoric iron.

X. Palatinate of Białystok (*Russ.* Бѣлостокъ; formerly in West Russia).

Białystok...	Meteoric stone.
Grodno (and environs)	Grodnolite, succinite.
Nowogród; Ostrołęka; Rajgrod; Wizna	Succinite.
Różany (*Ger.* Ruschany)... ...	Meteorite.

XI. Palatinate of Wilno (*Russ.* Вильно, Vilno, Вильна, Vilna; formerly in West Russia).

Pilwiszki...	Succinite.
Zabrodzie	Meteoric stone.

XII. Palatinate of Lublin (*Russ.* Люблинъ; formerly part of Russian Poland).

Bochotnica, *near* Kazimierz; Puławska Góra; Puławy; Wysokie, *near* Turobin ...	Lublinite.
Goraj	Glauconite.
Starościce	Celestine.

XIII. Palatinate of Wołyń (formerly part of Volhynia, *Russ.* Волынь, Volyn, *Ukr.* Волинь, Volin, in West Russia).

Bielczaki	Graphite.
Długa Wola [= Dolgovoli] ...	Meteoric stone.
Korzec	Graphite, microcline, tourmaline.
Okniny	Meteoric stone.

XIV. Palatinate of Polesie (formerly part of the government of Minsk, *Russ.* Минскъ, in West Russia).

Ćmień [= Zmenj]	Meteoric stone.

An alphabetical index of all the place-names in the above lists will be given at the end of volume 3 of 'Mineralogical Abstracts', to be issued with the December (1928) number of this Magazine.

On the atomic volume relations in certain isomorphous series. II.

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[Read March 20, 1928.]

THE isomorphous replacement of one element by another, in a pair of crystalline salts, is usually accompanied by a substantial change in the molecular volume. This progression is exceptionally well illustrated in the 'eutropic' elements K, Rb, Cs, and Cl, Br, I, which formed the subject of the first part of this paper.[2] It was there shown that the differences produced by interchanging these elements stood in the same ratio in all the salt-series, though the size of the differences varied with the acid radicle. The object of the present note is to draw attention to the existence of similarly constant (though different) ratios for the salts of O, S, Se, Te, and for the salts of Ca, Sr, Ba. The spacings in these compounds have recently been obtained by X-ray determinations, in many cases due to V. M. Goldschmidt and his co-workers, so that it is possible to verify the rule of proportional differences in these series, although the results do not possess an accuracy so high as that of densities measured by the pyknometer. The molecular volumes given in the following tables are calculated from the dimensions of the unit cell, as indicated by Wyckoff,[3] the real volumes being divided by $1{\cdot}65 \times 10^{-24}$ in order to reduce them to the ordinary chemical notation ($V = M/d$).

Table VI contains data for the oxides, &c., of the calcium metals. These form an unusually complete group which will be discussed before the general tables VII and VIII, which contain other salts of the two series.

The figures in the last column indicate a nearly constant ratio between the differences due to the interchange of the metals; the values in the lower lines show that a similar constancy holds good for the acidic elements, and is equally valid for oxygen, the fourth member of the group.

[1] Communicated by permission of the Director.
[2] A. F. Hallimond, Min. Mag., 1927, vol. 21, pp. 277–284 (Tables I–V).
[3] R. W. G. Wyckoff, The structure of crystals, 1924, p. 203.

The differences themselves show a progressive increase as the size of the unit cell increases.

Table VI. Molecular volumes of compounds of Ca, Sr, Ba, *with* O, S, Se, Te (*sodium chloride structure*).[1]

Type.	Ca.	Sr.	Ba.	Sr–Ca.	Ba–Ca.	$\frac{\text{Ba–Ca}}{\text{Sr–Ca}}$
CaO ...	16·76	20·64	25·64	3·88	8·88	2·29
CaS ...	27·85	32·85	39·10	5·00	11·25	2·25
CaSe ...	31·30	36·54	43·03	5·24	11·73	2·24
CaTe ...	38·65	44·50	51·63	5·85	12·98	2·22
Se–S ...	3·45	3·69	3·93			
Te–S ...	10·80	11·65	12·53			
Te–S Se–S ...	3·13	3·16	3·19			
S–O ...	11·09	12·21	13·46			
Te–O ...	21·89	23·86	25·99			
Te–O S–O ...	1·97	1·95	1·93			

A few other isomorphous series are available for these elements, and these are given in Tables VII and VIII.

Table VII. Molecular volumes of isomorphous salts of Ca, Sr, Ba.

Type.	Ca.	Sr.	Ba.	Sr–Ca.	Ba–Ca.	$\frac{\text{Ba–Ca}}{\text{Sr–Ca}}$
Free Metal[2]	25·9	36·0	[48·6]	10·1	[22·7]	—
CaF_2[3]	24·55	29·3	35·85	4·75	11·30	2·38
$CaTiO_3$[4]	34·6	36·5	37·9	1·9	3·3	(1·7)
					Ba–Sr.	
$SrSO_4$[5]	—	46·18	51·96	—	5·78	—
$SrCO_3$[5]	—	39·87	45·82	—	5·95	—
$Sr(NO_3)_2$[6]	—	71·0	80·4	—	9·4	—
$CaSiO_3$[5]	40·11	44·91	—	4·80	—	—
CaC_2[7]	28·9	35·0	43·0	6·1	14·1	2·31

[1] V. M. Goldschmidt, Geochemische Verteilungsgesetze der Elemente, VIII. Skrifter Norske Vidensk.-Akad. I. Mat.-nat. Kl. Oslo, 1927, no. 8 (for 1926), p. 20. [Min. Abstr., vol. 3, p. 326.]

[2] J. W. Mellor, Treatise on Inorganic Chemistry, 1923, vol. 3, p. 631.

[3] V. M. Goldschmidt, Geochemische Verteilungsgesetze der Elemente, VIII. 1927, p. 56.

[4] V. M. Goldschmidt, Geochemische Verteilungsgesetze der Elemente, VII. 1926, p. 79. Retaining the earlier (comparable) value for $CaTiO_3$.

[5] P. Eskola, Amer. Journ. Sci., 1922, ser. 5, vol. 4, p. 370.

[6] P. Groth, Chemische Krystallographie, 1908, vol. 2, p. 104.

[7] J. W. Mellor, Treatise on Inorganic Chemistry, 1924, vol. 5, p. 860.

Table VIII. Molecular volumes of isomorphous salts of O, S, Se, Te.[1]

Type.	O.	S.	Se.	Te.	Se–S.	Te–S.	$\frac{\text{Te–S}}{\text{Se–S}}$.
Zinc-blende structure:							
BeS ...	—	17·34	20·45	26·82	3·11	9·48	3·05
ZnS ...	—	24·08	27·50	34·20	3·42	10·12	2·96
CdS ...	—	29·91	33·40	40·90	3·49	10·99	3·15
HgS ..	—	30·05	33·85	40·39	3·80	10·34	2·72
Sodium chloride structure (see also Table I):							
MgO ...	11·28	21·16	24·55	—	3·39		
CdO ...	15·63	—	—	—			
PbS ..	—	31·30	34·99	40·45	3·69	9·15	2·48
MnO ...	13·22	21·05	24·55	—	3·50		
Cadmium iodide structure:							
TiS_2 ...	—	34·45	39·14	48·6	4·69	14·15	3·02

Partial volumes can be calculated by applying the rule of proportional differences to the metals and salts in Tables VI and VII, in the manner already used for the alkali compounds. The values for the free metals are not yet accurately established and isomorphism has not been fully proved. The value for barium has been calculated proportionately and is given for the purpose of comparison with the salts; the only recorded volume, 36·16, appears improbable, for it is nearly identical with the volume of metallic strontium. Using the values for Ca and Sr, the resulting volumes are shown in Table VII a; the remainders, representing the volumes of the negative elements or groups, correspond fairly closely with the values deduced for the same constituents in the alkali salts (Part I).

Table VII a. Calculated volumes of elements in salts of Ca, *&c.*

Type.	Ca.	Sr.	Ba.	Radicle.
CaF_2	12·2	16·9	22·8	12·5
$CaTiO_3$	3·8	5·2	7·0	31·0
$SrSO_4$	—	16·5	22·3	29·7
$SrCO_3$	—	17·0	23·0	19·8
$Sr(NO_3)_2$	—	26·9	36·2	44·2
CaO	10·1	14·1	19·0	6·5
CaS	12·8	17·8	24·1	15·0
CaSe	13·4	18·6	25·1	17·0
CaTe	14·8	20·6	27·8	23·9
$CaSiO_3$	12·3	17·1	—	27·8
CaC_2	16·1	22·4	30·2	12·8

[1] See V. M. Goldschmidt, Geochemische Verteilungsgesetze der Elemente, VIII. 1927, pp. 144, 146, 147.

The volumes for O, S, Se, Te, correspond closely with those of spheres having J. A. Wasastjerna's radii O = 1·32 Å., &c.; the metals are larger than those of Goldschmidt, since their volume includes that which would be assigned to interstitial spaces in a structure of hard spheres.

Relation to the law of constant atomic radii:—Data including those quoted in Tables VI and VIII have been discussed by V. M. Goldschmidt[1] from the standpoint of Bragg's law of constant atomic radii. From an extensive series of X-ray measurements, Goldschmidt[2] obtains the radii of the chemical elements by difference, starting with the assumption that the radius of oxygen is 1·32 Å., a figure derived by J. A. Wasastjerna from considerations relative to the refractive power of certain compounds. The radii are, in fact, not strictly additive, and it is of interest to compare the extent to which the molecular volumes deviate from the ideal conditions represented on the one hand by a law of constant atomic radii, and on the other by one of constant atomic volumes. If the volume of each atom remains the same throughout a series of isomorphous compounds, the differences produced by substituting an element of volume V_1 for one of volume V_2 should be constant, no matter what may be the size of the unit cell. With constant radii, on the other hand, the volume of the unit cell in the sodium chloride lattice is $8a^3$ where $a = r_1 + r_2$, the radii of the two atoms. If an atom of radius $r_2 + \delta$ is substituted for r_2, the volume of the cell is increased to $8(a+\delta)^3$; if δ is small this is approximately $8(a^3 + 3\delta a^2)$, i. e. the difference in the volume is $24\delta a^2$. The volume-difference in this case varies with the size of the cell, so that in cells with volumes V_1 and V_2 the ratio of the differences (d_1 and d_2) produced by a given substitution should be approximately $d_1/d_2 = a_1^2/a_2^2 = (V_1/V_2)^{\frac{2}{3}}$. In the following table the second column shows the difference produced by substituting one element for another in a small cell; the third column, the difference produced by the same substitution in a larger cell. Column 4 shows the ratio of these differences, and column 5 the ratio required by a law of constant radii.

The difference increases with the cell-size, but the increment never attains the proportion required for constant radii. The ratio d_2/d_1 varies from near unity up to $(V_2/V_1)^{\frac{1}{2}}$ (last column), and this would seem to represent the limit of the anomaly. Considered from the standpoint of a law of constant radii, the cells must be supposed to exhibit an

[1] V. M. Goldschmidt, Geochemische Verteilungsgesetze der Elemente, VIII. 1927, p. 57, &c.

[2] V. M. Goldschmidt, op. cit., No. VII, p. 15.

Table IX. Effect of substitution in cells of varying size.

Substitution.	Difference produced by substitution in compounds with:		$\frac{d_2}{a_1}$.	$\left(\frac{V_2}{V_1}\right)^{\frac{2}{3}}$.	$\left(\frac{V_2}{V_1}\right)^{\frac{1}{2}}$.
Sodium chloride lattice:	Cl.	I.			
Rb–K	5·69	6·50	1·14	1·24	1·18
Na–Li	6·33	8·00	1·26	1·34	1·25
	O.	Te.			
Sr–Ca	3·88	5·85	1·51	1·73	1·51
Ba–Sr	5·00	7·13	1·43	1·64	1·45
	Mg.	Ba.			
Se–S	3·39	3·93	1·16	1·47	1·33
S–O	9·88	13·46	1·36	1·60	1 42
	S.	Te.			
Sr–Ca	5·00	5·85	1·17	1·23	1·17
	Ca.	Ba.			
Se–S	3·45	3·93	1·14	1·24	1·18
Zinc-blende lattice:	S.	Te.			
Cd–Zn	5·83	6·70	1·15	1·24	1·18
	Be.	Cd.			
Se–S	3·11	3·49	1·12	1·42	1·30

anomalous expansion as the atoms become more closely spaced. From the standpoint of a law of constant volumes, on the other hand, the deviation would be regarded as a contraction of the smaller cells, in a manner which suggests that close-spaced compounds like the oxides are subject to a somewhat greater relative pressure than, say, the tellurides.

The present series offers an extreme example of isomorphism between compounds differing in molecular volume, and of the anomalous increment in the differences. Very frequently, as in the alkali sulphates, the differences are closely the same for all sizes of cell, and the volumes can be represented as strictly additive. Moreover, according to the law of Retgers, the molecular volume is additive in a series of isomorphous mixtures. If, as is generally supposed, the relation between neighbouring atoms in a mixed crystal of the present type is of the same nature irrespective of the chemical molecules to which they may belong, it is perhaps more consistent to extend the law of additive volumes to the constituent atoms, treating the above results as minor deviations from the well-established rule, rather than to regard both and those for all other crystals as deviations from a law of constant radii.

Note on the alkali-lavas of Mount Nimrud, Armenia.

By Dr. G. T. Prior, M.A., D.Sc., F.R.S.
Late Keeper of Minerals in the British Museum (Natural History).

[Read March 15, 1927.]

THE object of this note is not to give elaborate descriptions of rock-sections, but to call attention to the fact that the old volcano of Nimrud, situated on the west side of lake Van in Armenia, was the centre of eruption of alkali-lavas presenting striking similarities to some of the alkali-rocks of the Rift Valley in East Africa.

To Dr. Felix Oswald, in his book on the geology of Armenia,[1] we owe a detailed description of this ancient volcano, of which the vast crater, now half occupied by a deep lake, is more than five miles across. An interesting series of the lavas from the volcano was collected by Dr. Oswald and was presented by him to the British Museum. On looking over thin slices of these rocks under the microscope, I was at once struck by the surprising resemblance of some of them, with their phenocrysts of anorthoclase and scattered tufts of aegirine and the soda-amphiboles, riebeckite and cossyrite, to rocks in Prof. J. W. Gregory's collection from the Rift Valley which I had described.[2] Judging from Dr. Oswald's collection, the lavas of Nimrud do not show a very great diversity in character. They are almost all of alkaline type with anorthoclase the prevailing felspar; but, like the lavas of the Rift Valley, they vary in basicity from those containing free quartz, and thus corresponding to the riebeckite-rhyolites (comendites) of Gilgil on Lake Naivasha (loc. cit., p. 242), to others resembling somewhat the kenytes of Mt. Kenya with abundant phenocrysts of corroded anorthoclase in a more or less glassy base. A characteristic feature of almost all, as of the East African rocks, is the presence in small amount of small phenocrysts of fragmental olivines (probably fayalite) and green aegirine-augite.

The oldest lavas, forming the main mass of the crater-walls on the south and south-west, and the lavas erupted from vents on the floor of

[1] F. Oswald, A treatise on the geology of Armenia. Printed and published by the author at 'Iona', Beeston, Notts., 1906.

[2] G. T. Prior, Contributions to the petrology of British East Africa. Min. Mag., 1903, vol. 13, pp. 228–263.

the crater, and thus, according to Dr. Oswald, the most recent, are of almost precisely similar type. They are soda-rhyolites (or comendites), some holocrystalline and exhibiting well-marked flow-structure, others either completely glassy obsidians or obsidians containing fairly large spherulites. Those of holocrystalline type show striking and beautiful features in thin slices under the microscope. Phenocrysts of anorthoclase and orthoclase, somewhat sparsely distributed, are seen in a felt of felspar laths through which are scattered tufts and needles of grass-green aegirine, dark reddish-brown cossyrite, and deep indigo-blue riebeckite. Quartz is present either as angular grains, sometimes surrounding the felspar phenocrysts, or in micropoecilitic patches as a sort of mosaic in which the constituents of the groundmass are embedded. In this respect these rocks resemble the 'phonolitic quartz-trachytes' of the Rift Valley (loc. cit., p. 242). The results of a chemical analysis of one of these rocks (B.M. Reg.-no. 1917, 631, 2) is as follows under I. Under II, for comparison, is given an analysis by H. S. Washington of an aegirine-pantellerite from Costa Zeneti, Pantelleria.[1]

	I.		II.
SiO_2	71·82	...	69·79
TiO_2	0·20	...	0·89
Al_2O_3	13·20	...	11·91
Fe_2O_3	1·46	...	5·35
FeO	3·07	...	1·43
MnO	0·06	...	0·20
MgO	0·03	...	0·25
CaO	0·90	...	0·25
Na_2O	6·03	...	5·66
K_2O	3·40	..	4·59
H_2O	0·27	...	0·21
P_2O_5	—	...	0·13
	100·44		100·66

The rocks of later eruption, referred to as 'cindery basalts' by Dr. Oswald, which cover the rhyolites of the crater-rim and slopes on the north and west and were poured out over the surrounding country, especially to the west of the crater, are darker and a little more basic than the rhyolites, but are alkali-rocks of somewhat similar composition. Like the kenytes of Mt. Kenya, they are characterized by very abundant phenocrysts of anorthoclase much corroded and permeated by the base, and also by the presence of fragmental and fairly large phenocrysts of olivine and aegirine-augite. In some of these rocks the groundmass is

[1] H. S. Washington, Journ. Geol., 1913, vol. 21, p. 703.

glassy, but in others it has characters somewhat similar to those of the rhyolites and shows densely crowded grains of aegirine or aegirine-augite with, in some specimens, tufts of altered cossyrite and a little interstitial quartz between the felspar laths. Some of these rocks, found as loose blocks on the floor of the crater and on the north-east rim, are brecciated and consist of fragments of trachyte or rhyolite in a glassy base.

The results of an analysis of one of these kenyte-like rocks (B.M. Reg.-no. 1917, 631, 36) is as follows under III. For comparison, under IV is given an analysis by H. S. Washington of a trachyte from Mt. Gibele, Pantelleria.[1]

	III.		IV.
SiO_2	63·07	...	63·30
TiO_2	0·51	...	0·71
Al_2O_3	18·31	...	16·38
Fe_2O_3	2·04	...	2·54
FeO	2·41	...	2·36
MnO	0·08	...	—
MgO	0·49	...	0·84
CaO	2·25	...	1·62
Na_2O	6·27	...	6·36
K_2O	4·63	...	4·41
H_2O	0·13	...	0·93
P_2O_5	—	...	0·30
	100·19		99·75

The analysis shows that this more kenyte-like rock does not differ in chemical composition very much from the rhyolite except in the lower percentage of silica and rather higher percentages of lime and magnesia. It may be described as a pantelleritic trachyte.

Of rocks making a closer approach to basalts, as they contain phenocrysts of a more basic felspar showing well-marked twin-striations, instead of anorthoclase, there are three specimens in Dr. Oswald's collection. One of these is from the shelf projecting into the crater-lake on the north, another from Kizvag on Lake Van, and the third from Morkh in the Musch Plain. Under the microscope these rocks show abundant phenocrysts of felspar, with well-marked twin-striations having symmetrical extinctions of from 20° to 30°, in a base of felspar laths with only a few small interstitial grains of olivine and augite and some magnetite. A chemical analysis of the somewhat altered rock from Kizvag (B.M. Reg.-no. 1917, 631, 44) gave the following result under V. Under VI,

[1] H. S. Washington, Journ. Geol., 1913, vol. 21, p. 688.

for comparison, is given an analysis by H. N. Stokes of a trachyandesite from Elkhorn Mt., Montana, U.S.A.[1]

	V.		VI.
SiO_2	58·80	...	59·64
TiO_2	1·16	...	1·08
Al_2O_3	16·94	...	16·64
Fe_2O_3	3·76	...	2·33
FeO	4·00	...	4·35
MnO	0·08	...	—
MgO	1·77	...	2·10
CaO	4·79	...	4·59
Na_2O	4·07	...	3·31
K_2O	3·50	...	4·16
H_2O	1·83	...	0·83
P_2O_5	—	...	0·49
	100·70		99·68

The analysis shows that this rock differs from the preceding trachyte mainly in a further slight decrease in silica and corresponding further increase in lime and magnesia. It may be described as a trachyandesite.

Judging from the published descriptions, many of the lavas from Armenian volcanoes show a tendency to alkaline characters, but in none does this appear to be so marked as in these rocks from Mt. Nimrud. In this connexion the tectonic position of the volcano may have some significance. As stated by Dr. Oswald (loc. cit., p. 151), Nimrud is situated on the great line of fracture which cuts across the Armenian folds and extends through the Red Sea to the Rift Valley, exactly at the point of intersection of this fracture with the great fracture running SE. to NW. which delimits Lake Van and the Musch Plain on the south.

[1] J. S. Barrell, Ann. Rep. United States Geol. Survey, 1901, no. 22, p. 525.

The identification of dumortierite as grains; dumortierite in Cornish granite.

By A. W. Groves, M.Sc., D.I.C.
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[Communicated by Dr. A. Brammall; read March 20, 1928.]

THE following notes are intended to bring to the notice of workers on heavy mineral grains the possible confusion between blue tourmaline, purple tourmaline, glaucophane, lepidolite, andalusite, pleochroic sillimanite, and dumortierite. Dumortierite (when blue) is very liable to be passed over as the more common mineral glaucophane, the optical properties of the cleavage-flakes of these minerals being similar in several respects.

Having seen a grain of dumortierite from the Wealden of Surrey, kindly lent me by Mr. H. A. Hayward, I was impressed by the remarkable nature of its pleochroism. A day or so later, while examining some concentrates of the Blackheath Beds of Shirley, Surrey, belonging to Mr. G. M. Davies, I came across a single grain which he had described as glaucophane.[1] The pleochroism seemed too intense for a grain of glaucophane of that thickness, and it occurred to me that the tint observed, when the grain was in the position of maximum absorption, was exactly that of the dumortierite grain. On testing with a quartz-wedge, it was found that the pleochroic scheme was wrong for glaucophane and agreed with that of dumortierite. Shortly afterwards a further grain of what had quite naturally been taken to be glaucophane, in the Bagshot Beds of Bournemouth, displayed an identical range of pleochroism and pleochroic scheme. Both of the 'glaucophane' grains referred to satisfy all the optical properties—as far as can be determined in a permanent mount—of a (100) cleavage flake of dumortierite showing traces of the less perfect (110) cleavage. As both the grains are small (about 0·2 mm.) it has been thought advisable to await the discovery of further grains of the mineral before confirmation of the determination is undertaken by means of refractive index liquids and chemical tests.

[1] Trans. Croydon Nat. Hist. Sci. Soc., 1916, vol. 8, p. 91.

For purposes of comparison, figs. 1–3 have been prepared to show diagrammatically the optical properties displayed by grains of dumortierite, glaucophane, and andalusite. It will be seen that, provided the grain is elongated parallel to the vertical crystallographic axis, there need be no confusion between dumortierite and tourmaline, for the former shows maximum absorption for rays vibrating parallel to the length and the latter for rays vibrating in a direction perpendicular to the length of

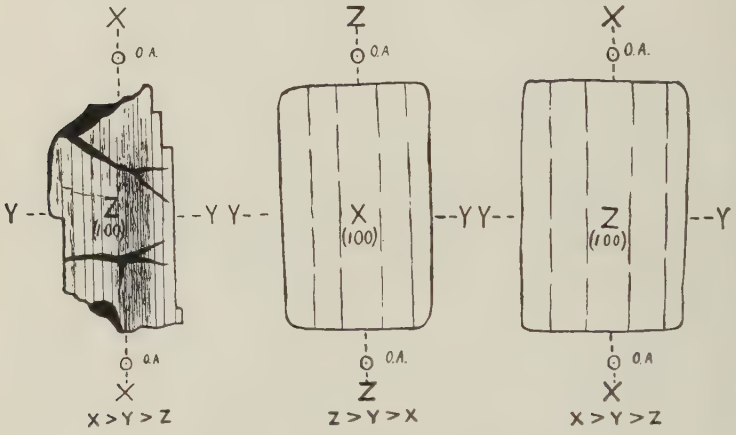

Fig. 1. Fig. 2. Fig. 3.

Fig. 1. Dumortierite from the 'coarse' granite at Trevella, Cornwall. Length of crystal fragment, 0·5 mm.

Fig. 2. Glaucophane, diagram of optical orientation.

Fig. 3. Andalusite, diagram of optical orientation.

the crystal. However, when prismatic form is lacking, a dumortierite grain may be readily passed over as a blue tourmaline. It therefore behoves us to examine blue tourmaline more carefully and to obtain the interference figure or determine the pleochroic scheme in all doubtful cases. Curiously enough, in Mr. Hayward's slide and in Mr. Davies's slides the supposed dumortierite is accompanied by plentiful blue tourmaline frequently showing pleochroism, like that of blue dumortierite, from nearly colourless to a very intense blue. Dumortierite also occurs with a number of other ranges of pleochroism and, when not showing its prismatic form, may be mistaken for brown or purple tourmaline. When showing pleochroism from about colourless to rose-purple it may be confused with andalusite. When dealing with glaucophane it should be possible

in many cases to show that the extinction is not quite straight. It will be appreciated from the diagram that the most ready method of distinction between glaucophane and dumortierite is the determination of the pleochroic scheme. My experience with dumortierite shows that the absorption is very variable, and that while it is usually quite as strong as in tourmaline, in some cases it is very much less. This may possibly be connected with a variable boron content.

Text-books differ as to the nature of the dispersion in dumortierite, but the majority give $\rho < v$. All the grains mentioned in these notes, as well as a specimem of dumortierite from Dehesa, California, in the collection of the Imperial College, gave $\rho < v$. Generally this is quite marked.

Dumortierite in the Granite of Land's End, Cornwall.

Two specimens from near Trevella, one of the 'coarse' granite and one of the 'fine' granite (as distinguished by H.M. Geological Survey), were crushed and examined for dumortierite, with the result that the mineral was found to be one of the less common accessories in the 'coarse' variety. It occurs as grains of all sizes up to half a millimetre, but owing to the good cleavage this gives no indication of the size of the largest crystals in the rock. The dumortierite of fig. 1 was sketched from this material. The shape of the grains is always prismatic, with strong indications of cleavage. The pleochroism is from colourless to mauve and then intense mauve or purple-brown, which in the larger grains means darkness for rays vibrating parallel to the length This is the same range of colour as displayed by the dumortierite of Dehesa, California. Some of the smallest grains were not unlike sillimanite in outline, being wispy and in some cases bent. The sign of elongation serves to distinguish a pleochroic sillimanite from dumortierite. The twinning on (110) commonly seen in the Californian material was observed in a few of the larger grains. The interference-colours are about the same as in quartz. The mineral was only noted in the non-magnetic portion of the heavy residue.

At first glance it appeared that the 'fine' granite contained a fair amount of dumortierite, but it was soon found that in nearly every case the sign of elongation was positive and that the mineral was lepidolite with very similar pleochroism—from nearly colourless to purple-brown. Similar lepidolite has been noted by Dr. P. K. Ghosh from the Bodmin granite.[1]

[1] P. K. Ghosh, Min. Mag., 1927, vol. 21, p. 296.

Both the purple-brown and blue varieties of dumortierite have been recently found in the Dartmoor granite by Dr. A. Brammall.[1] It is quite probable that it will be found in some of the other granites of the south-west of England; meanwhile the writer hopes that these notes may help in the identification of the mineral both in its primary sources and in sediments.

Dumortierite was first recorded as a British mineral by Dr. William Mackie,[2] who detected it by its characteristic pleochroism in gneiss, pegmatite, and granite from Aberdeenshire and Banffshire, and also in a specimen of Cornish granite (? St. Austell).

The writer is indebted to both Mr. Davies and Mr. Hayward for allowing him to examine their slides (in connexion with other work), otherwise the present notes would not have been written.

Since the above was written, Mr. J. G. C. Leech has found dumortierite, mainly of mauve and brown shades, in the St. Austell granite. The writer has also found a single grain of blue dumortierite in the Bridport Sands, West Bay, Bridport, Dorset. The refractive index of this grain could be seen to be slightly higher than that of the blue tourmaline and glaucophane occurring in the same field under the microscope. Its pleochroism is from very pale blue to deep azure-blue. Another striated grain of dumortierite, with pleochroism from colourless to intense blue-black, has been observed in the non-magnetic portion of a concentrate of the Bagshot Beds from midway between Wimborne and Ringwood, Dorset. A further grain, identical with the last, has been found in the Upper Greensand of Lulworth Cove, Dorset. In the last two cases the mineral suites yield strong evidence of derivation in part from the Dartmoor granite, and, as the dumortierite is of a type so far only recorded in this country from Dartmoor, it seems likely that this granite was its source. The writer's discovery of six grains of dumortierite in the sediments of southern England in two months leads him to suggest that the mineral is not so rare as hitherto supposed, and that a keen watch should be kept for it.

[1] A. Brammall, Dartmoor Detritals. Proc. Geol. Assoc. London, 1928, vol. 39, pp. 43–44.

[2] W. Mackie, Dumortierite in British rocks. Trans. Edinburgh Geol. Soc., 1925, vol. 11, p. 352 [Min. Abstr., vol. 3, p. 205]. The paper was read at a meeting of the Society on December 19, 1923, and a report of it appeared in Geol. Mag., 1924, vol. 61, p. 185.

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